Research on Modular Development of Artificial Intelligence General Education Courses in the Context of Civil Affairs Vocational Education

Zhanxiong Liu*

China Civil Affairs University, Beijing, 102600, China
**Corresponding author: LiuZhanXiong@bcsa.edu.cn*

Abstract: *With the continuous development of artificial intelligence technology, new demands for talent education in vocational education have emerged. Delivering artificial intelligence general education effectively to learners from all walks of life and at different levels of prior knowledge has become one of the main problems in the curriculum construction of vocational undergraduate programs. The subject of this paper is civil affairs vocational education, which is a typical professional cluster that covers all stages of life, and we will examine the modular development path of artificial intelligence general education courses. According to the adaptability analysis of course positioning in this study, the knowledge system attribute of the course is "bridge-type", and thus a knowledge selection strategy is proposed to distinguish between technical appearance and underlying logic. Therefore, the three-level progressive modular curriculum system of "foundation-application-extension" has been established according to the above. The general ideas and systems of thought are in the basic principles module, and the professional mapping module combines knowledge from general technology with specific civil affairs. According to Cognitive Load Theory, the following teaching stages will be introduced gradually. Revisions have been made to the basic ideas of teaching artificial intelligence and the model for interdisciplinary cooperative learning to build an organised curriculum system that promotes technical literacy.*

Keywords: *Civil Affairs Vocational Education, Artificial Intelligence General Education Courses, Modular Development, Technical Literacy, Curriculum Construction.*

Introduction

Artificial intelligence technology has developed to some extent, and now it is being used in many parts of life. Vocational education should add AI literacy to the training content for students in schools. AI technology is being used in many places for vocational education in civil affairs, such as healthy ageing, modern funeral services, rehabilitation assistance technology and social work, etc.; therefore, practitioners need to be able to understand the technical logic, judge the technical boundaries and cooperate in technical application. Learners have all sorts of professional backgrounds and different levels of knowledge. Artificial intelligence general education courses need to meet the high demand for cultivating technical literacy among students and also consider the different starting points of these students. At the same time, with the rapid development of technology, the content of the courses has also been evolving. In light of the changes in demand for technological development and talent education at the civil affairs vocational college, this paper studies the modular development of artificial intelligence general education courses and systematically explores the three aspects of course positioning, content construction and teaching methods.

1. Analysis of Adaptation Between Course Positioning and Interdisciplinary Knowledge Requirements

1.1 Definition of the Course Attributes for Artificial Intelligence General Education

Artificial intelligence general education courses that are not the same as the computer science professional courses have been added to the civil affairs vocational education system. The first aim of such a course is not to train technical talents who can develop algorithms; rather, it hopes to help learners without a technical background form an organised understanding and critical awareness of AI

technology. Therefore, the selection of course content should not be limited to the level of technical operation; rather, the basic ideas, application scope and social connotations of artificial intelligence should also be covered in more detail. The aim of this course is to help students learn how artificial intelligence can be employed as a "support tool" in all areas of civil affairs service and to equip them with good communication skills for technical systems in their future work.

According to curriculum theory, artificial intelligence general education is at the intersection of general literacy and professional application. According to the attributes of the course, a "bridge-type" knowledge system will be constructed. On the one hand, this system should have logical rigour and conceptual consistency in artificial intelligence; at the same time, it needs to be in harmony with the fundamental knowledge system of all majors in the field of civil affairs. The two attributes are in conflict during course construction; that is, we need to ensure the correctness of the technical knowledge, but we also have to consider how easily different professional backgrounds of learners can grasp this knowledge. Therefore, the definition of course attributes provides the foundation for the development of modules and sets the stage for content selection and the form of knowledge presentation[1].

1.2 Cognitive Starting Points and Hierarchical Needs of Different Professional Backgrounds

One of the main problems with the professional background of the learners needs to be addressed in the course development. Learners come from all sorts of places, such as healthy ageing, modern funeral services, rehabilitation assistance technology, social work and marriage services. The structure of the prior knowledge for artificial intelligence in terms of cognitive reserve is not the same. Some students have only been exposed to the use of technology in daily life, and others have gained a deeper understanding of information technology. Given that the learners have different levels of cognitive development, various entry points for knowledge in the course should be set up to offer different degrees of learning support for all students.

Given that people have different amounts of prior knowledge, the contents of this course need to be organised reasonably. The foundation level is for all students, and it covers the basic concepts, general rules, development paths, etc., of artificial intelligence to build a common knowledge foundation. Provide a brief introduction to a particular field of knowledge and present some cases of its application in all kinds of AI services. Hierarchy is used to organise the students, but it can also be applied to arrange the course materials in various ways according to the different levels of students' cognition and professional needs. The Division of Hierarchical Needs will also consider some technical application cases for students' future careers and ensure that the course content meets the current demands of learning and is in line with later professional studies and technological changes.

1.3 Knowledge Selection and Content Stability Strategies in the Era of Change

The development speed of artificial intelligence is too high; thus, the content of this course will soon become outdated. New Model Architectures, Application Models and Development Tools have been continually released. If the course content is too far ahead of the times, it will be difficult for students to learn and organise the knowledge they have acquired about artificial intelligence systematically. Based on the above, Knowledge Selection should set a screening norm to distinguish between "technical appearance" and "underlying logic"; content at the level of technical appearance has good timeliness and can be used as material for trend introduction. The content at the level of underlying logic is relatively stable, consisting of algorithm ideas, system architecture concepts and data operation methods, and it makes up the main structure of the course content.

To unify the stability of content and the dynamism of life, some filtering will be added. The foundation of this paper is the general ideas and thought systems of artificial intelligence, such as data-driven cognitive methods, the basic process of model training and probabilistic relations between input and output. The above have good cross-cycle stability. The expanded area will be updated with the latest technology and added to the curriculum in a module form so that it can be adjusted according to changes in technology. The two-tier system will help to avoid the problem of division in the course content due to rapid changes in technology, and students will also be able to learn about new technologies. Therefore, the course system will provide a stable basis, and updateable peripheral modules can be added according to the demands for the spread of knowledge and the open nature of content display[2].

2. Modular Construction of Course Content Based on the Characteristics of Civil Affairs Professional Clusters

2.1 Logical Framework and Hierarchical Design of the Modular Curriculum System

The construction logic of the modular curriculum system should be clear, and it needs to consider the actual circumstances of different professional backgrounds and various cognitive starting points of learners in the context of civil affairs vocational education. The three levels of the framework are "foundation", "application" and "extension", and they have different teaching goals and content purposes. The foundation stage will present the basic ideas and general rules of artificial intelligence, build a common knowledge base for all students, and provide a solid foundation for further study for these students. The application level is to present functions that can turn technical knowledge into practical applications in all kinds of professional fields, and to apply general artificial intelligence technology to all types of service scenarios in civil affairs majors and show how different business logics implement these technologies. Extension Level: Deals with new problems and technological ethics in the development of artificial intelligence to help students form their own ideas and judgments on the limits of technology.

The three levels are not independent; rather, they will work together to provide full support at the top. The conceptual tools provided at the basic level are used in all parts of the teaching process for the application and extension levels. Concrete cases at the application stage can help the students better grasp the principles learned in the foundation stage. The problems of ethics at the extension level should be considered in light of the concept framework of the foundation level. A hierarchy has been set up in the curriculum system, and it is now flexible. Learners from different schools and with different hopes for their future lives can choose from the three grades. For example, a two-year vocational undergraduate programme can reduce the amount of content in the extension period and improve the connection with application and professional circumstances. Four-year vocational undergraduate programmes can still have the full three-tier structure and offer more organised training in technical literacy for students.

2.2 Basic Principles Module: Condensation of Core Concepts and Thinking Paradigms

The aim of the basic principles module is to organise the large system of knowledge in the field of artificial intelligence into a small number of necessary ideas that can be learned by people without a technical background. At the stage of condensation, we need to choose conceptual units that are very representative and transferable, such as the synergy among the three elements of data, algorithms and computing power; the logical distinction between supervised learning and unsupervised learning; the basic structure and information transfer mode of neural networks; and the fundamental process of model training, validation and testing. The above ideas provide a cognitive basis for learning about the working principles of artificial intelligence technology; thus, students will be able to understand the reasons for the operation of this technology rather than just using it superficially. Selection of concepts also considers how often they will be used in all sorts of professional situations in civil affairs, so the learned content will have cross-domain applicability[3].

The aim of the first few sections is to arouse young children's interest in discovery; they will learn through exploration. In short, the three main types of thinking in artificial intelligence are data-driven inductive thinking, probabilistic result interpretation thinking and modular thinking based on system architecture. Teaching the thinking paradigms mentioned above should be practical; for example, one can use daily life scenarios to introduce the hierarchical structure of neural networks and present the classification logic of a simple decision tree. Learners will learn the basic ideas and gradually form their own systems of thought to understand the essence of artificial intelligence technology. Cultivation at the level of thinking allows learners to transfer and adapt based on their understanding of the underlying logic, so even if the form of technology changes in the future, they will no longer be dependent on specific technological tools.

2.3 Professional Mapping Module: Knowledge Integration of General Technology and Specific Domains

The first goal of the professional mapping module is to integrate general artificial intelligence technology with all areas of professional knowledge in civil affairs and provide specific support for the course. The cluster of healthy ageing professionals is included in this section, and we will learn about

the application logic of intelligent perception and health monitoring technology, such as how non-contact sensing, behaviour recognition, anomaly alerting, etc., are used in elderly care situations to meet the changing demands of care. The content of the module for the modern funeral management professional cluster is now digital humanities and virtual interaction technology; it is exploring how technologies such as digital memorials and the creation of virtual spaces can meet the new social demand for life commemoration and pays attention to balancing technological ethics with humanistic values[4].

The professional cluster of rehabilitation assistive technology and social work will study the construction path of assisted decision-making and human-machine collaboration in the professional mapping module. Artificial intelligence can help social workers organise information and connect people with resources in their daily work, but the responsibility and final decisions must still be with the professionals. At present, the main problems of technological integration in the area of rehabilitation assistive technology are the personalisation of intelligent devices and the optimisation of human-machine interaction. The scope of application for intelligent matching and affective computing in the main area of marriage services and management is expanding. The design of the map for each professional direction is based on the idea of "parallel operation of technical logic and professional logic", so it can ensure the correctness of technical knowledge and respect the inherent knowledge systems and value norms of all professions. Therefore, the students know about the deficiencies in the application of technology and can still learn how to use it.

3.Teaching Strategies and Path Optimisation for the Cultivation of Technical Literacy

3.1 Layered Progressive Teaching Design Based on Cognitive Load Theory

Cognitive Load Theory can be used to organise teaching activities so that they are suitable for all students and help them start learning from various places. The three kinds of cognitive load in this theory are intrinsic cognitive load, extraneous cognitive load and germane cognitive load. The inner cognitive load is due to the difficulty of the learning materials. Extraneous cognitive load is caused by an ill-presented problem. Germane cognitive load is the mental effort students put in to build schemas and organise knowledge. The main sources of intrinsic cognitive load in artificial intelligence general education courses are the abstractness of the conceptual system of artificial intelligence and the complexity of technical logic; therefore, they need to be reduced through knowledge decomposition and hierarchical organisation. The knowledge system of artificial intelligence should be divided into several relatively independent modules, and learners can learn these basic units first; then they will gradually study the more complex concepts, otherwise, there will be too much information and cognitive overload.

The three stages of the layered progressive design are in fact "Core Essential", "Deepening Expansion" and "Integrated Application". First of all, there is the "core essence"; it contains only the most basic concept clusters and thinking systems, so concrete and analogical teaching methods are used to reduce extraneous cognitive load and help learners build initial cognitive frameworks efficiently. The Expansion Stage has added some special applications and technical details. At this time, the learners have formed a basic cognitive system and can integrate the new knowledge with their existing knowledge structure to make good use of germane cognitive load. There are many activities in the Integrated Application stage to help students organise the knowledge they have learned separately and build a system for applying this knowledge in real life. Based on the above Design, we need to consider the differences in the starting points of the various students and adjust the content and presentation of the lessons accordingly to effectively promote their development of technical literacy.

3.2 Pedagogical Transformation and Presentation Path of the Essential Characteristics of Artificial Intelligence

Some attributes of artificial intelligence will differ from those of traditional information technology, and this will change what is taught in class. The above attributes are random and not fixed in the output results; it is a black-box system that cannot be observed from the inside, and the process of the emergence of abilities is unpredictable. Based on the above abstract attributes, and in order to make them more accessible to non-technical learners, this paper will present some comparative differences and real-life examples. A comparison and difference method is used to compare artificial intelligence systems with traditional software systems based on input-output relationships, error manifestation

patterns, boundary conditions, etc., and then, through comparison, the distinct characteristics of artificial intelligence are identified. The Design of embodied experience can have learners directly feel the uncertainty of artificial intelligence systems through interactive activities; for example, they can observe all the output results after issuing the same instruction several times or learn how to modify the input content to change the output and gain an experiential understanding of probability.

The teaching presentation of the main features should also be connected with the limits of technological application. Learning about the probability of an event can help us know that artificial intelligence systems are not perfect in all cases. As black-box models are not generally transparent, experts have begun to pay more attention to the interpretability of algorithms. Knowing what to expect from the system can help us be more vigilant and pay attention to any deviations in the actual results. By changing the focus from the technical characteristics of artificial intelligence to its application scope, students can learn not only what artificial intelligence is but also what it can and cannot do; in all the professional fields of civil affairs, this correct perception of the limits of technology is required for the responsible application of AI technology and directly impacts the quality of services and professional ethics.

3.3 Collaborative Learning and Knowledge Sharing in Cross-professional Environments

The different professional backgrounds of the students are a problem at the level of teaching, but they can also be used as a good opportunity to promote knowledge transfer at the level of learning design. At the foundation of cross-professional collaborative learning is the interaction among members of different groups, so general knowledge of artificial intelligence can be combined with specific knowledge from various areas in different professions. In the Design of collaborative learning tasks, students from all walks of life should be grouped together to jointly achieve the goal of envisioning technological applications in civil affairs service scenarios. Learners in the healthy ageing major know the needs of older persons; learners in the social work major are familiar with service processes; and learners in the modern funeral management major are aware of the dimension of life culture, thus they form complementary knowledge resources for this task. Artificial intelligence technology can be applied in many different places, and all kinds of knowledge are now organised in various ways.

The good operation of the knowledge-sharing mechanism is based on the "sharing prompts" set in the task Design. A Trigger is the situation in a person's life that requires the application of AI ideas. In planning the introduction of the intelligent monitoring system, one should consider both the technical feasibility and the needs of the service users. In the Design of intelligent interactive services for learners, one should also consider the elements of humanistic care. Triggers should have learners recall the AI knowledge they have learned in group discussions and integrate it with their own professional background knowledge to achieve the goal of converting classroom knowledge into application ability. The results of cooperative learning include not only knowledge of how to use artificial intelligence technology but also the cultivation of cross-professional problem-solving abilities that can be directly applied to all-weather service situations in the field of civil affairs.

Conclusion

The three modules of the development framework for AI general education courses in this study are course positioning, content construction and teaching methods. At the level of course positioning, this paper proposes that the attribute of artificial intelligence general education is a "bridge-type" knowledge system; thus, we will carry out a cognitive starting point analysis and a hierarchical division of needs to put forward a knowledge selection strategy that distinguishes between technical appearance and underlying logic. The three levels of the construction for the content are "foundation", "application" and "extension"; the basic idea of the module is to condense core concepts and thinking models, and the professional mapping module is to integrate knowledge from general technology and specialisation in civil engineering. In line with the theory of cognitive load, all kinds of tiered and differentiated instruction have been employed; a new path has been opened for the development of artificial intelligence education, and a cross-disciplinary collaborative learning model for knowledge sharing has been established. In the future, we will be able to build an evaluation model for the results of module learning, determine a suitable way to match modules according to the different circumstances of individuals, and design and implement a dynamic content update mechanism for courses.

References

[1] Feng, Yanna, et al. Research on the Implementation Path of Artificial Intelligence General Education Based on the TPACK Model. Journal of Yulin University, vol. 36, no. 02, 2026, pp. 117-124.
[2] Liu, Tie, and Zhang, Ran. Construction and Practical Exploration of Artificial Intelligence General Education Courses. Information Technology Education in Primary and Secondary Schools, no. 03, 2026, pp. 37-38.
[3] Wu, Bo. Cultivating High-Skilled Talents in the Age of Artificial Intelligence: Compilation Ideas and Usage Suggestions for the Textbook 'Artificial Intelligence General Education'. Vocation, no. 02, 2026, pp. 43-46.
[4] Liu, Jun, et al. Research on the Construction of a Layered Teaching System for Artificial Intelligence General Education Courses in Higher Vocational Education. Modern Vocational Education, no. 05, 2026, pp. 111-114.