Asia Pacific Science Press

Journal of Educational Theory and Practice
ISSN(O):3005-9313
ISSN(P):3005-9305
Vol. 2 No.2 (2025)

Research on the Construction and Practice of the Micro-Certification System for College students' artificial Intelligence Literacy

Pei Chen*

Shanghai University of Finance and Economics Zhejiang College, Jinhua, Zhejiang, 321000, China

Corresponding author: Pei Chen , Pei Chen cpmini5@163.com

Abstract: This paper focuses on the micro-certification system for college students' artificial intelligence literacy and deeply explores its construction and practice paths.It analyzes the current needs and challenges faced by college students in the cultivation of artificial intelligence literacy and expounds on the importance of constructing a micro-certification system.From aspects such as the construction principles,elements,standards, and realization paths of the system,it discusses in detail how to build a scientific and reasonable micro-certification system.At the same time,it studies the practical promotion strategies of this system in colleges and universities,including curriculum integration,platform construction,faculty training,and incentive mechanisms.The aim is to improve college students' artificial intelligence literacy through the construction and practice of the micro-certification system,enable them to better adapt to the development needs of the digital era,and provide a reference for the innovation of the talent-training model in colleges and universities.This paper focuses on the micro-certification system for college students' artificial intelligence literacy and deeply explores its construction and practice paths.It analyzes the current needs and challenges faced by college students in the cultivation of artificial intelligence literacy and expounds on the importance of constructing a micro-certification system.From aspects such as the construction principles,elements,standar ds,and realization paths of the system,it discusses in detail how to build a scientific and reasonable micro-certification system. At the same time,it studies the practical promotion strategies of this system in colleges and universities,including curriculum integration,platform construction,faculty training,and incentive mechanisms.The aim is to improve college students' artificial intelligence literacy through the construction and practice of the micro-certification system,enable them to better adapt to the development needs of the digital era,and provide a reference for the innovation of the talent-training model in colleges and universities.

Keywords: College Students; Artificial Intelligence Literacy; Micro-Certification System; Practice Research

Published: May 26, 2025

DOI: https://doi.org/10.62177/jetp.v2i2.399

1.Introduction

Artificial Intelligence(AI for short,also known as intelligent machinery or machine intelligence in English)refers to machines made by humans that can exhibit intelligence.Usually,artificial intelligence refers to the technology that presents human intelligence through ordinary computer programs.This term also refers to the study of whether such intelligent systems can be realized and how to achieve them.The definition field of artificial intelligence in general textbooks is"the research and

design of intelligent agents",where an intelligent agent refers to a system that can observe the surrounding environment and take actions to achieve goals.John McCarthy's definition in 1955 was"the science and engineering of making intelligent machines".Andreas Kaplan and Michael Haenlein defined artificial intelligence as"the ability of a system to correctly interpret external data,learn from these data,and use this knowledge to achieve specific goals and tasks through flexible adaptation". Having a certain level of artificial intelligence literacy is not only a requirement for personal career development but also an essential ability to adapt to future social competition.However,currently,there are many deficiencies in the cultivation of college students' artificial intelligence literacy in colleges and universities.The curriculum settings are scattered,lacking systematic planning,and the teaching content is divorced from practical applications,making it difficult for students to form a complete artificial intelligence knowledge system and practical ability.Constructing a micro-certification system for college students' artificial intelligence literacy can provide clear learning goals and paths for college students,quantitatively evaluate students' learning achievements in the field of artificial intelligence in the form of micro-certifications,motivate students to learn actively,and improve their artificial intelligence literacy.This is of great significance for promoting the educational and teaching reform in colleges and universities and cultivating innovative talents who meet the needs of the times[1].

2.The Necessity and Feasibility of Constructing a Micro-Certification System for College students' Artificial Intelligence Literacy

2.1 The Demand for College students' artificial Intelligence Literacy in the Development of the Times

With the in-depth application of artificial intelligence technology in various industries,such as intelligent diagnosis in the medical field,risk prediction in the financial industry,and personalized learning in the education field,the social demand for talents with artificial intelligence literacy is increasing day by day.As the main force of future society,college students need to master the basic concepts,principles,and technical applications of artificial intelligence and have the ability to solve practical problems using artificial intelligence.Only in this way can they gain an advantage in future career development and adapt to the rapidly changing job market.For example,in science and technology innovation enterprises,college students with artificial intelligence literacy can better participate in the research and development of intelligent products,data analysis and processing,and other work,injecting new vitality into the development of enterprises.

2.2 Analysis of the Current Situation of Artificial Intelligence Education in Colleges and Universities

Currently,there are problems in the artificial intelligence education curriculum system in colleges and universities.Many artificial intelligence courses in colleges and universities are scattered in different majors,lacking systematicness and coherence.The teaching methods are traditional,mainly focusing on theoretical lectures,and the practical teaching links are weak.Students lack practical operation and project practice opportunities and find it difficult to transform the knowledge they have learned into practical abilities.In addition,the construction of the teaching staff lags behind.Some teachers have insufficient artificial intelligence knowledge reserves and practical experience and cannot meet the teaching needs.These problems lead to poor results in the cultivation of college students' artificial intelligence literacy,and there is an urgent need to optimize artificial intelligence education by constructing a micro-certification system.

2.3 The Advantages and Characteristics of the Micro-Certification System

The micro-certification system is flexible.It breaks the time and space limitations of traditional certifications,allowing students to independently choose learning content and certification projects according to their interests and time arrangements.It is highly targeted and can design personalized micro-certification modules according to the needs of students of different majors and levels,meeting the diverse learning needs of students.At the same time,the micro-certification focuses on the assessment of practical abilities.Through actual project operations,work exhibitions,and other methods,it comprehensively evaluates students' artificial intelligence application abilities,making the certification results more reflective of students' true levels.

2.4 The Theoretical and Practical Basis for Constructing the Micro-Certification System

Theoretically,the learning outcome certification theory provides a theoretical support for the micro-certification system,which emphasizes a comprehensive and objective evaluation of students' learning process and outcomes.The competency-based education theory focuses on cultivating students' practical abilities.The micro-certification system is competency-oriented and designs certification content according to different competency standards,which is in line with this theory.In practice,some

colleges and universities and educational institutions at home and abroad have already carried out explorations of micro-certifications and accumulated certain experience.

3.The Construction Elements and Standards of the Micro-Certification System for College students' Artificial Intelligence Literacy

3.1 The Goal Orientation of the Micro-Certification System

The goal of the micro-certification system for college students' artificial intelligence literacy is to cultivate students to have a solid foundation in artificial intelligence knowledge,including basic concepts,development history,and main technologies of artificial intelligence.Enable students to master the basic principles and application methods of core technologies such as machine learning and deep learning and be able to use these technologies to solve practical problems.At the same time,cultivate students' innovative thinking and practical abilities,and encourage students to carry out innovative practices in the field of artificial intelligence,such as developing intelligent application programs and participating in artificial intelligence project research.

3.2 The Design and Division of Certification Modules

According to the knowledge system and application fields of artificial intelligence,the certification modules are divided into basic theory modules,including introduction to artificial intelligence and mathematical foundations(such as linear algebra,probability theory,etc.),which help students establish basic concepts and mathematical foundations of artificial intelligence.The technology application module covers the applications of technologies such as machine learning,deep learning,computer vision,and natural language processing,cultivating students' practical operation abilities.The practical innovation module improves students' practical and innovative abilities through actual project practices,innovation and entrepreneurship activities,etc[2].The ethics and society module focuses on artificial intelligence ethics,laws,and social impacts,guiding students to view the development of artificial intelligence technology correctly.Each module is further subdivided into multiple micro-certification projects,and students can choose corresponding projects for learning and certification according to their interests and needs.

3.3 The Formulation and Refinement of Certification Standards

The formulation of certification standards follows the principles of scientificity,objectivity,and operability.For the mastery of basic knowledge,it is evaluated through theoretical examinations,online tests,etc.,requiring students to accurately understand and master relevant concepts and principles.In terms of technical application abilities,it is assessed through actual project operations,work exhibitions,etc.,requiring students to be able to independently complete artificial intelligence application projects,such as developing a simple image recognition system or a natural language processing model.The evaluation of practical innovation abilities focuses on students' innovation points,teamwork abilities,and problem-solving abilities in project practices.

3.4 The Design of Certification Methods and Processes

The certification methods adopt diversified assessment methods,including online assessments,such as quizzes after online course learning and online assignment submissions,which are convenient for students to learn and be assessed anytime and anywhere.Practical operation assessments require students to carry out actual project operations in the laboratory or on the online practice platform,and they are evaluated on-site by teachers or industry experts.Work evaluations require students to submit their artificial intelligence project works,such as software programs and research reports,and they are evaluated through expert reviews.The certification process includes student registration and enrollment,where students choose the micro-certification projects they are interested in;learning and practice,where students conduct independent learning and practice according to project requirements;application for certification,where students submit certification applications after completing learning and practice tasks;assessment and evaluation,where professional certification institutions or teacher teams conduct assessments and evaluations according to certification standards;and issuance of certificates,where corresponding micro-certification certificates are issued to students who pass the assessment.

4.The Practice and Promotion Strategies of the Micro-Certification System for College

students' artificial Intelligence Literacy

4.1 Integration with the College Curriculum System

In the current digital era,college education faces the important task of cultivating talents who meet social needs.Integrating the certification modules of the micro-certification system for college students' artificial intelligence literacy with the existing college curriculum system is a key measure to improve students' artificial intelligence literacy[3].In terms of professional courses,different majors can skillfully integrate artificial intelligence knowledge and skills according to their own characteristics and the relevance to artificial intelligence.Taking the computer science and technology major as an example,machine learning and deep learning have become the core driving forces for the development of this field.In the curriculum setting,further increase the teaching proportion of this part of the content.Not only should the principles of machine-learning algorithms,such as decision trees and neural networks,be systematically explained,but also through actual case analysis,students can deeply understand the applications of algorithms in data classification,prediction,and other aspects. At the same time,introduce deep-learning frameworks such as TensorFlow and PyTorch,allowing students to build models by themselves and deal with actual problems such as image recognition and natural language processing,effectively improving students' practical abilities.

4.2 Construction of Practice Platforms and Resources

Practice is the only criterion for testing truth.For the cultivation of college students' artificial intelligence literacy,the construction of practice platforms and resources is of vital importance.The construction of an artificial intelligence practice platform aims to provide students with a real and convenient practical operation and project practice environment.As an important position for practice,the laboratory platform is essential to be equipped with advanced artificial intelligence experimental equipment and software tools.High-performance computers are the basis for running complex artificial intelligence algorithms and processing large-scale data.Their powerful computing power can accelerate the model-training process and enable students to verify the effectiveness of algorithms in a short time.Deep-learning frameworks such as Keras and MXNet provide students with efficient model-development tools,reducing the development threshold and allowing students to focus on algorithm innovation and application practice.At the same time,equipped with professional servers and storage devices to meet students' needs for big-data storage and processing.The online practice platform breaks the limitations of time and space.With the help of Internet technology,it provides rich online experiment and simulation project services through the network platform.Students can log in to the platform for practical learning anytime,whether on campus or at home.Online experiments adopt the form of virtual laboratories,simulating real-world experimental environments.Students can perform operations such as algorithm debugging and model training in the virtual environment and obtain experimental results and feedback in real time.Simulation projects are designed according to actual application scenarios,such as intelligent transportation system simulation and intelligent medical diagnosis simulation,allowing students to experience the application of artificial intelligence technology in virtual scenarios and cultivate their ability to solve practical problems.

4.3 Construction and Training of the Teaching Staff

The teaching staff is the core force of education.For the implementation of the micro-certification system for college students' artificial intelligence literacy,it is crucial to build a high-quality artificial intelligence teaching staff.First,increase the intensity of talent introduction and actively introduce teachers with artificial intelligence professional backgrounds and rich practical experience.These teachers not only have solid theoretical knowledge but also can integrate actual project experience into teaching,bringing cutting-edge technical knowledge and practical guidance to students.They can share their actual cases in enterprise projects in class,allowing students to understand the latest development trends of the industry and broaden students' horizons.For existing teachers,regularly organizing artificial-intelligence-related training courses and academic seminars is an effective way to improve their teaching levels and practical abilities.Training courses can invite industry experts to teach,and the content covers the latest technological developments and teaching method innovations in artificial intelligence.For example,conduct special training on the latest developments of deep-learning algorithms,allowing teachers to understand the latest model architectures and training methods so that they can teach students in class.Academic seminars provide a platform for teachers to communicate and learn.Teachers can share their teaching experiences and scientific research achievements at

the seminars and jointly discuss the problems and solutions encountered in teaching.Encourage teachers to actively participate in enterprise practices and scientific research projects,cooperate with enterprises to carry out artificial intelligence application research,and transform scientific research achievements into teaching content.By participating in enterprise practices,teachers can understand the actual needs of enterprises,master the latest industry technologies,and provide more abundant cases and practical guidance for teaching.

4.4 Incentive Mechanisms and Promotion Strategies

To improve students' enthusiasm for participating in the micro-certification system for college students' artificial intelligence literacy,it is imperative to establish a sound incentive mechanism and effective promotion strategies.In terms of the incentive mechanism,schools should give full play to the guiding role of policies and closely link micro-certification certificates with credit recognition,scholarship evaluation,and employment recommendation.Credit recognition is an important part of students' academic evaluation.Linking micro-certification certificates with credits,students can obtain corresponding credits by completing micro-certification projects,which can motivate students to actively participate in micro-certification learning.In the evaluation of scholarships,give priority to students who have obtained micro-certification certificates,which not only reflects the recognition of students' learning in artificial intelligence but also sets an example for other students and stimulates more students' enthusiasm for learning artificial intelligence.When recommending employment,give priority to recommending students who have obtained micro-certification certificates to enterprises.When recruiting talents,enterprises pay more and more attention to students' practical abilities and professional qualities.Micro-certification certificates can prove students' learning achievements and practical abilities in the field of artificial intelligence and improve students' artificiaent competitiveness.In terms of promotion strategies,make full use of various channels such as the school official website,social media,and campus lectures to comprehensively publicize the content,advantages,and significance of the micro-certification system.The school official website,as an important platform for school information release,sets up a special publicity page for the micro-certification system,introducing in detail the curriculum settings,certification processes,assessment standards,etc. of the micro-certification system,allowing students to fully understand the micro-certification system.Use social media platforms such as WeChat official accounts and Weibo to regularly release relevant information and developments of the micro-certification system,attracting students' attention with vivid and interesting content.Hold campus lectures,invite experts,scholars,and corporate executives in the field of artificial intelligence to give lectures,share the development trends,application cases,and career prospects of artificial intelligence,and stimulate students' interest and motivation in learning artificial intelligence.

5.Conclusion

Constructing a micro-certification system for college students' artificial intelligence literacy is an important measure to adapt to the development needs of the times and improve college students' artificial intelligence literacy.By analyzing the demand for college students' artificial intelligence literacy in the development of the times,the current situation of artificial intelligence education in colleges and universities,and the advantages and characteristics of the micro-certification system,the necessity and feasibility of constructing the micro-certification system are clarified.From aspects such as goal orientation,certification module design,certification standard formulation,and certification method and process design,a scientific and reasonable micro-certification system is constructed.In terms of practical and promotion strategies,the effective implementation of the micro-certification system in colleges and universities is promoted through measures such as integration with the college curriculum system,construction of practice platforms and resources,construction of the teaching staff,and establishment of incentive mechanisms.The construction and practice of this system help to cultivate college students' artificial intelligence literacy,improve students' artificiaent competitiveness and innovative abilities,and provide new ideas and methods for the innovation of the talent-training model in colleges and universities.In the future,with the continuous development of artificial intelligence technology and the update of educational concepts,the micro-certification system for college students' artificial intelligence literacy will be continuously improved and optimized,playing a greater role in cultivating more high-quality talents who meet the needs of the digital era.

Funding

Supported by Zhejiang Higher Education Association Project，KT2024193

Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

Reference

[1] Tang, Q., Yin, Z., & Zhang, H. (n.d.). The cultivation goals and implementation strategies of college students' digital literacy in the context of generative artificial intelligence. Library Work and Research, 1–12.

[2] Yang, X., & Wang, Y. (n.d.). Research on the digital media literacy education of college students in the artificial intelligence era. China Adult Education, 1–9.

[3] Long, H. (2024). Research on the cultivation of college students' information literacy in the artificial intelligence environment. University, (31), 69–72.