Region-Educational Research and Reviews, 2025,Volume 7, Issue 2
DOI:10.12238/rerr.v7i2.3475
ISSN Online:2661-4634
ISSN Print:2661-4626

Status of Artificial Intelligence Literacy Research in China

Wei Zhou

School of Weinan Normal University, Weinan, Shaanxi, China

Abstract: The Chinese government attaches great importance to the enhancement of AI literacy, related departments have issued a series of relevant policy documents since 2017, elevated AI to a national strategy, and strengthened the cultivation of talents in the field of AI in the education system. Using the China Knowledge Network database as a source of literature, this study finds that the research progress of AI literacy in China has focused on three aspects, including the connotation of AI literacy, the framework of AI literacy, and the path of AI literacy, by combing the relevant literature.

Keywords: China, intelligent literacy among people, current research status

Introduction

Artificial Intelligence (AI) is setting off a wave of intelligent change on a global scale. As the core driving force of the fourth industrial revolution, artificial intelligence is becoming more and more prominent in its strategic position in international competition. Countries around the world are paying increasing attention to AI literacy, and have successively formulated relevant policies to actively promote the construction of the AI education system and talent cultivation. The United States comprehensively promotes the construction of a diversified AI talent team, the United Kingdom strengthens the cultivation of high-level AI talents, Germany strengthens higher education and vocational education, and Japan builds a multi-level AI talent cultivation system. In addition, international organizations such as UNESCO and OECD are also promoting global AI literacy education, emphasizing the importance of enhancing public AI literacy and providing strategic directions and action frameworks on a global scale.

In recent years, China has also attached great importance to improving the artificial intelligence literacy of the entire population. Through education, training and policy guidance, China is committed to fostering the public's basic understanding and application of AI to adapt to the trend of digital transformation and lay a solid foundation for surviving and developing in the smart society of the future.In August 2017, the General Office of the State Council promulgated the New Generation of Artificial Intelligence Development Plan, which upgraded AI to a national strategy for the new era. In 2018, the Ministry of Education issued the the Action Plan for Artificial Intelligence Innovation in Higher Education, proposing to increase the cultivation of talents in the field of artificial intelligence and encouraging college teachers to go deeper into the popularization and research of AI education in primary and secondary schools, which provides a new direction for the exploration and development of AI education in primary and secondary schools. 2024 The Government Work Report for the first time puts the "Artificial Intelligence + Action " is written into it. Talent cultivation planning in the age of intelligence has risen to a national strategy, and the cultivation of AI literacy has been urgent.2024 In March, the Ministry of Education launched the AI-enabled education initiative, launching four specific actions aimed at promoting the integration of teaching and learning applications with AI, improving the literacy and skills of the entire population in digital education, and developing a large model of AI dedicated to education, as well as regulating the use of AI in the

scientific and ethical manner. In December of the same year, the General Office of the Ministry of Education issued a notice to explore ways to implement AI education in primary and secondary schools and strengthen AI education in primary and secondary schools.

Artificial intelligence literacy has become a core literacy for the survival and development of individuals in the age of intelligence, and domestic scholars have conducted a large number of related studies based on their own national conditions. This study aims to sort out China's research progress in the field of AI literacy, analyze its research hotspots and development trends, with a view to providing reference and inspiration for the future development of AI education.

2. Research design

In this study, the China Knowledge Network database was used as the source of literature search, and the keywords "artificial intelligence literacy" or "intelligence literacy" or "AI literacy" were used to search for titles with a search date of The search date was December 17, 2024, and a total of 153 articles were retrieved. A total of 153 documents were retrieved, 145 after excluding conferences and newspapers, including 125 journal articles and 20 dissertations.

3. Findings

Analyzing the 145 documents obtained from the search, in terms of the annual number of publications, the period from 2018 to 2021 is the initial exploration period of AI literacy in China, and the number of publications after 2021 grows rapidly and enters a rapid development stage, with an exponential growth trend in the number of publications per year.

The literature related to AI literacy mainly contains three types of research topics, namely, research on the connotation of AI literacy, research on the framework of AI literacy, and research on the path of AI literacy cultivation.

3.1 Connotation of artificial intelligence literacy

Domestic scholars have not yet formed a unified consensus on the definition of the connotation of AI literacy, and most scholars start from the concept of literacy that has been widely recognized by the academic community, such as information literacy, digital literacy, etc., refer to the connotation of their concepts, make clear the relationship between different literacies, and combine the characteristics of the application of AI technology, so as to define the conceptual connotation of AI literacy.

The relationship between AI literacy and other literacies is broadly categorized by academics as inclusive, concurrent, and iterative. First, some scholars believe that AI literacy is part of information literacy. For example, Yu Xiaoya[1], Wang Chunli[2], and Zhang Weidong et al.[3] define AI literacy as "information literacy in the age of intelligence", and AI literacy is the core of information literacy, which is an all-around comprehensive literacy of knowledge, competence, literacy, and personality in which man and machine coexist and the real and the imaginary go hand in hand. Secondly, the relationship between AI literacy and other literacy is considered to be a juxtaposition. For example, He Juling[4], Xu Ruiyue et al.[5], Li Jiaxin et al.[6], and Sun Dian[7] regard AI literacy as a kind of independent literacy, and juxtapose it with other literacies, such as information literacy and digital literacy, to become a new type of literacy in the category of literacy. Third, most scholars view AI literacy as an extension and upgrade of information literacy, digital literacy, etc. in the age of intelligence. Wang Yijun et al.[8] believe that AI literacy originates from information literacy to some extent, and digital literacy is the basic condition of AI literacy. Zhang Yinrong et al.[9] believe that the biggest difference between AI literacy and other literacy (e.g., media literacy, information literacy, etc.) lies in the application of competence, i.e., the ability to flexibly use intelligent technology, computational thinking, etc. to deal with and solve problems in the face of problematic dilemmas. Dong Hui et al.[10] argue that AI literacy is an iterative update of previous information literacy and data literacy. Li Jialing et al. [11] consider AI literacy as an improvement of the original digital literacy and information literacy based on a comprehensive literacy that integrates ethics, awareness, ability and knowledge.

Artificial intelligence literacy and other literacies, such as information literacy and digital literacy, which are literacies that citizens are required to possess in order to adapt to the environment of the times under the constant updating and iteration of technology, have obvious similarities, such as interdisciplinarity, multidimensionality and developmental nature. They are integrated literacies in terms of knowledge, skills, attitudes, values and ethics. While information literacy focuses

on the basic understanding of information and digital literacy extends to knowledge of ICT applications, AI literacy goes deeper, involving an understanding of the basic concepts and scope of applications of AI technologies [12], with a greater emphasis on the ethics of the technology and its social implications.

3.2 Artificial intelligence literacy framework

The research on AI literacy framework is a hot research topic in China in recent years. This study has sorted out the representative AI literacy framework research among them.

Scholars have studied the AI literacy framework for a wide range of subjects, involving primary and secondary school students, college students, rural teachers, library users and all citizens. The AI literacy frameworks constructed for different groups are also different. In terms of the indicators of the literacy framework, the indicators constructed for specific groups are more comprehensive and have more secondary indicator points, while the generalized indicators for all citizens are more basic and have relatively few secondary indicator points.

Early researches mainly started from the theory of education and teaching to construct a literacy framework for specific groups. For example, Zheng Qinhua et al. constructed a five-dimensional framework of intelligent knowledge, intelligent ability, intelligent thinking, intelligent application, and intelligent attitude based on Gagne's classification theory of learning outcomes; the Central Electrification Education Pavilion constructed a literacy framework for primary and secondary school students based on engineering thinking in the four major domains of AI and human beings, AI and society, AI technology, and AI system design and development; Yang Hongwu et al. based on the STEM education concept, proposed a four-dimensional literacy framework of core concepts, technical practices, interdisciplinary thinking, and ethical attitudes; Zhang Yinrong et al. utilized the five concepts of AI to propose a three-dimensional AI literacy framework of knowledge, competence, and ethics.

The later stage of research is more about proposing an AI literacy framework based on existing studies or reports. At this stage, numerous research results have been accumulated, and scholars use the literature analysis method to analyze existing studies and propose an optimized literacy framework for the problems in existing studies. For example, Su Wencheng et al. use NVivo software to qualitatively analyze relevant literature and propose a five-dimensional literacy framework; Huang Ruhua et al. use systematic literature analysis to analyze relevant literature and propose a thinking literacy framework. At this stage, scholars pay more attention to constructing a literacy framework from exploring the essential connotation of AI literacy. For example, Quan Guolong et al. construct a four-dimensional literacy framework of educational awareness, educational knowledge, teaching ability and educational norms from the perspective of the connotation of information literacy; Guo Yajun et al. put forward a six-dimensional framework of awareness, understanding, knowledge, skills, assessment and creation from the perspective of the connotation of AI literacy.

In summary, the research on AI literacy frameworks has shown a trend of diversification, multidimensionality and depth. With the depth of the research, scholars not only construct a literacy framework for specific groups from educational and pedagogical theories, but also begin to propose an AI literacy framework based on existing research results or reports, and pay more attention to constructing a literacy framework from exploring the essential connotation of AI literacy. Research has gradually shifted from relying on other educational and pedagogical theories to independently exploring doctrinal logic in order to construct a more precise literacy framework.

3.3 Artificial intelligence literacy cultivation path

The cultivation of artificial intelligence literacy is a complex and multidimensional process involving multiple aspects such as knowledge, skills, ethics and evaluation. Different groups are oriented to different AI literacy cultivation paths, and currently scholars are mainly exploring AI literacy cultivation paths for students and teachers in schools, and some scholars are exploring cultivation paths for library users.

Research on the cultivation path of AI literacy has been explored by scholars mainly from the school, social and national levels, showing the trend of multi-body participation, but with more emphasis on school learning support and evaluation. At the school level, the cultivation path is mainly proposed from the perspectives of students, teachers and

learning support. Among them, learning support involves curriculum, learning environment, teaching mode, resource construction and the concept of talent cultivation goals. From the students' perspective, Cai Yingchun et al.[12] suggest that AI literacy education should be carried out in three aspects: interdisciplinary knowledge system construction, ability construction and practical application, and moral awakening and responsibility. From the perspective of teachers, Wang Ming[22], Song Jikai[23], Peng Yulan[24], and Pei Xiaojuan[25], etc., suggest to improve teachers' intelligent literacy in terms of their cognition, ability, and concepts about AI, and to cultivate intelligent faculty; and from the perspective of learning support, with respect to curricula, Wang Ming[22], Song Jikai[23], Wang Yijun [8], et al. and Qin Pensou[26], and Songmei Liu[27], suggesting that AI courses should be offered to optimize and improve the construction of the curriculum; regarding the learning environment, Zhiqiang Xu[28] suggests building a realistic environment for media education based on comprehensive perception and remote collaboration; regarding the teaching mode, scholars[27-30] suggest that an innovative teaching mode should be based on creator education, deep learning, project learning, project-based learning, etc. to build an intelligent literacy-oriented curriculum teaching mode; on the construction of resources, Liu Songmei mentioned that the construction of AI literacy educational resources should be strengthened as a material guarantee for intelligent literacy education; on the talent cultivation goals and concepts, scholars[8][23] mainly focus on college and university students and propose that the talent cultivation goals of AI literacy should be improved, and talent cultivation concepts should be innovated. At the social level, scholars [22][31,32] suggest strengthening school-enterprise cooperation in the cultivation of intelligent literacy and improving the pre-service training system of intelligent education. At the national level, most scholars suggest that policy standards related to the development of intelligent literacy cultivation should be formulated and developed.

In summary, there are more studies on AI literacy paths in China, and scholars have proposed corresponding cultivation paths for school students, teachers, library users and other groups, but there are fewer studies on AI literacy paths for other social groups, especially for the general public in a universal way. In terms of specific path measures, involving the school, social and national levels, the research covers a wide range of areas, with the main focus on the school level, especially learning support, and the path measures for the social and national levels are more singular and generalized.

4. Summary

Artificial intelligence literacy has become a focus of attention in countries around the world. The Chinese government attaches great importance to the improvement of AI literacy, and since 2017, it has issued a series of relevant policy documents, has elevated AI to a national strategy, and has strengthened the cultivation of talents in the field of AI in the education system.

This study comprehensively compiles and analyzes the research progress in the field of artificial intelligence literacy in China. The findings show that the research on AI literacy is entering a rapid development stage from the preliminary exploration period, with an exponential growth in the number of publications; the research hotspots are mainly focused on three aspects: the connotation of AI literacy, the construction of the framework, and the cultivation path.

As for the research on the connotation of AI literacy, domestic scholars have not yet formed a unified consensus on the connotation of AI literacy, but most of the scholars believe that it involves knowledge, skills, attitudes, values, and ethics, and is the extension and upgrading of information literacy and digital literacy in the age of intelligence.

For the research on AI literacy frameworks, studies have constructed a variety of AI literacy frameworks for different groups, which cover multiple dimensions such as intelligent awareness, intelligent attitude, intelligent ethics, intelligent knowledge, intelligent skills, intelligent thinking and intelligent innovation, etc., and the research shows a trend of diversification, multidimensionality and in-depthness, and it has gradually shifted from relying on other educational and pedagogical theories to independently exploring the logic of theology.

As for the research on the path of AI literacy, the research on the path of cultivation involves multiple levels of school, society and the state, and the main object of research is school students, with less research on the path of AI literacy for

other social groups. Moreover, the path measures for the social and national levels are relatively single and generalized.

Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

References

[1] Yu Xiaoya. Research on the analysis of the connotation and enhancement strategy of teachers' information literacy under the perspective of artificial intelligence [J]. Journal of the Chinese Society of Education, 2019, (08): 70-75.

[2] Wang Chunli, Xing Haifeng. Theoretical Research and Action Inspiration on Artificial Intelligence Literacy from Vertical and Horizontal Perspective [J]. Modern Educational Technology, 2024, 34 (01): 73-83.

[3] Zhang Weidong,Chen Xipeng, Zhao Hongying. Global Library Science in the Era of Data Intelligence: Current Status, Hotspots, and Trends——The Reviews of 88th IFLA World Library and Information Congress 2023[J].Information Science, 2023, 41(12): 1-8,32.

[4] He Juling. Research on the Goal and Curriculum of Teacher Education IntegrationUnder the Background of Educational Modernization[J].Journal of Shaanxi Normal University(Philosophy and Social Sciences Edition), 2020, 49(03): 149-160.

[5] Xu Ruiyue, Liang Haonan, Zhou Qin. The Energization of Artificial Intelligence to Educational Reform:International Experience and Future Expectation [J]. Digital Education, 2021, 7(03): 21-26.

[6] Li Jiaxin, Zhou Ling. Research on Curriculum Construction Mechanism from the Perspective ofArtificial Intelligence [J]. Journal of Hubei Adult Education Institute, 2022, 28 (05): 33-38.

[7] Sun Dian, Wang Li. The Connotation, Dilemma and Paths of High quality Development of Chinese Higher Education Empowered by Artificial Intelligence [J]. Modern Education Management, 2024, (06): 34-42.

[8] Wang Yijun, Wang Yingmei, Yang Youran. The Content System and Development Approach of AILiteracy Education in Colleges and Universities [J]. Heilongjiang Researches on Higher Education, 2022, 40 (02): 26-31.

[9] Zhang Yinrong, Yang Gang, Xu Jiayan, et al. The Cultivation of AI Literacy Model and its Implementation Path [J]. Modern Educational Technology, 2022, 32(03): 42-50.

[10] Dong Hui, Liu Xu, Zhou Xinyue, et al. The Concept, Framework and Development Strategyof Teachers' Intelligent Education Literacy [J]. Journal of Hangzhou Normal University(Humanities and Social Sciences), 2023, 45(04): 79-87.

[11] Li Jialing, Long Mengqing. A New Approach to Vocational Teachers' Professional Development under ChatGPT Rush [J]. Journal of Ningbo Polytechnic, 2024, 28(03): 103-108.

[12] Cai Yingchun, Zhang Jingbei, Yu Chenlin, et al. Artificial Intelligence Literacy in the Digital Intelligence Era: Connotation, Framework and Implementation Pathways [J]. Journal of Library Science in China, 2024, 50(04): 71-84.

[13] Hou Hezhong, Wang Yonggu. A Probe into the Framework Construction and Cultivation Mechanism of Intelligent Literacy of Primary and Secondary School Students in the Era of Artificial Intelligence [J]. Digital Education, 2020, 6(06): 50-55.

[14] Zheng Qinhua, Qin Mengyuan, Li Shuang. Study on the Theoretical Model of Artificial Intelligence Competencyin the Era of Human-Machine Collaboration [J]. Fudan Education Forum, 2021, 19(01): 52-59.

[15] National Center for Educational Technology, Artificial Intelligence Technology and Engineering Literacy in Primary [S]. 2021, https://www.ncet.edu.cn/u/cms /www/202304/201559072pfc.pdf

[16] Yang Hongwu, Zhang Di, Guo Weitong. A Study of Literacy Framework of Artificial Intelligence in STEM Context [J]. e-Education Research, 2022, 43 (04): 26-32.

[17] Quan Guolong, Du Hua, Ma Li. Intelligent Literacy of Rural Teachers:"Bridging"Framework,Evolution Stage and Guarantee Conditions [J]. Modern Distance Education Research, 2023, 35 (02): 67-72+84.

[18] Su Wencheng, Guo Haoran, Lu Zhangping, et al. Construction of artificial intelligence literacy evaluation index system and validation of its effectiveness in China's college and university student population [J/OL]. Library

Development, 1-25[2024-12-18].http://kns.cnki.net/kcms/detail/23.1331.G2.20240624.1801.004.html.

[19] Wu Ruohang, Mao Yihong. Research on the Framework and Content of Artificial Intelligence Literacy Educationin Libraries [J]. Library & Information, 2024, (04): 90-100.

[20] Guo Yajun, Kou Xuying, Feng Siqian, et al. Artificial Intelligence Literacy: Connotation Analysis and Evaluation Criteria Construction [J/OL]. Library Tribune 1-9[2024-12-18].http://kns.cnki.net/kcms/detail/44.1306.G2.20240826.1624.002.html.

[21] Huang Ruhua, Shi Leyi, Wu Yingqiang, et al. Constructing Content Framework for Artificial Intelligence Literacy Instruction in China from a Global Perspective [J]. Documentation,Information & Knowledge, 2024, 41 (03): 27-37.

[22] Wang Ming. The Construction of Students' Intelligent Literacy Based on Core Literacy and Its Cultivation [J]. Contemporary Education Sciences, 2018, (02): 83-85.

[23] Song Jikai. Investigation of Normal University Students' Artificial Intelligence Literacy and Research on Training Strategies in the AI Era [D]. Huaibei Normal University, 2021.

[24] Peng Yulan. Research on the Current Situation and Improvement Strategy of Information Technology Teachers in Primary and Secondary Schools Based on AI [D]. Central China Normal University, 2022.

[25] Pei Xiaojuan. Research on the Current Situation and Improvement Path of Artificial Intelligence Literacy of Teacher Students in the Context of New Teacher Training [D]. Guangzhou University, 2023.

[26] Qin Pengxu. Project-Based Learning Activity Design of Artificial Intelligence Course for Cultivating Intelligence Literacy [D]. Jiangnan University, 2022.

[27] Liu Songmei. Research on the practice strategy of AI literacy education in college libraries [J]. Shanxi Archives, 2024, (08): 175-177.

[28] Xu Zhiqiang. Intelligent Literacy Education for Applied Media Talents in the Perspective of New Liberal Arts [J]. Media Education, 2021, (23): 82-84.

[29] Zhong Xiuping. Research on the Teaching Mode of Artificial Intelligence Curriculum in Middle School Oriented by Intelligent Literacy [D]. Guangzhou University, 2023.

[30] Zhao Xiaowei. Research on the Teaching Mode of Maker Education in Primary Schools for the Cultivation of Intelligent Literacy [D]. Hebei Normal University, 2023.

[31] Zai Bingxin, Ye Lan, Lin Weiming, et al. Research on AI Literacy Education Practice Models in University Libraries in the Context of AIGC ——Based on the Investigation of 60 World-class University Libraries [J/OL]. Library Journal, 1-17[2024-12-18].http://kns.cnki.net/kcms/detail/31.1108.G2.20240906.0926.002.html.

[32] Chen Xia. Research on Promotion Strategy of Intelligent Literacy [J]. Library Work and Study, 2022, (10): 47-53.

Fund project

Horizontal scientific research project 'Development of Artificial Intelligence Literacy Evaluation Tool for College Students' of Weinan Normal University in 2024 (Project No. 24HX310).