International Journal of Arts and Social Science www.ijassjournal.com
ISSN: 2581-7922,
Volume 8 Issue 12, December 2025

Research on the Promotion Strategy of Digital Literacy in the Intelligent Era

Yang Jiang[1]

[1]*International Media College，Tianjin Foreign Studies University.*

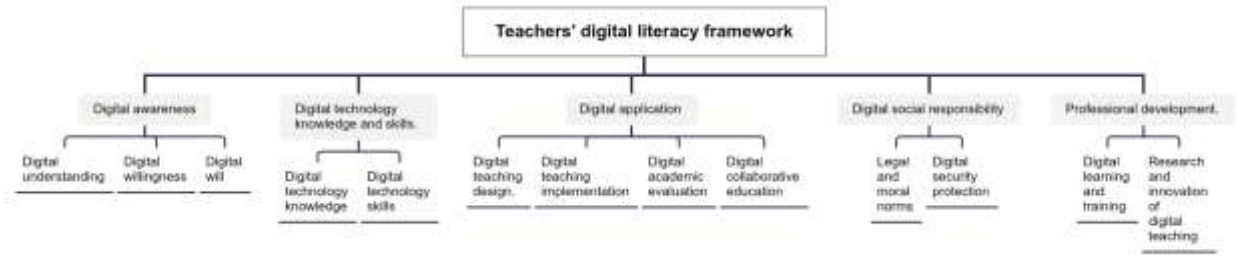
Abstract: The rapid proliferation of digital technologies, particularly generative artificial intelligence, has catalyzed transformative changes across multiple sectors, including education. In the context of the digital intelligence era, the effective integration of artificial intelligence into educational practice is crucial for enhancing instructional efficiency and innovating pedagogical models. Despite these advancements, significant challenges persist in the educational sector, notably the insufficient development of teachers' digital literacy, which impedes the seamless adoption of intelligent technologies in schools. This paper systematically examines the current state of teachers' digital literacy and identifies obstacles to its advancement. The primary objective is to propose targeted strategies to enhance teachers' digital literacy, thereby facilitating the meaningful integration of intelligent technologies into school teaching and promoting the overall digital transformation of education.

Keywords: Generative artificial intelligence, teachers'digital literacy, the era of number intelligence, teacher development

Digital intelligence refers to the use of big data, artificial intelligence, cloud computing, and other technologies to intelligently analyze and use data to assist people in solving technical problems more efficiently. In the era of digital intelligence, many fields are gradually using intelligent technology to innovate, especially in the field of education. Generative artificial intelligence and digital people can help teachers improve teaching and innovate teaching models. Therefore, teachers must have relevant knowledge to better apply intelligent technology to teaching. In November 2022, the Ministry of Education promulgated the "Teachers' Digital Literacy" education industry standard, which states : "Teachers should use digital technology to optimize, innovate, and change the awareness, ability, and responsibility of education and teaching activities. It makes teachers have better adaptability and innovation in education and teaching in the digital age and intelligent age." Improving teachers' digital literacy is an inevitable part of creating a team of socialist teachers with Chinese characteristics in the new era, and it is also the key to realizing educational informatization(Feng Hu,2024).

I. The realistic dilemma of teachers ' digital literacy improvement.

Improving teachers' digital literacy is a comprehensive project, but now, throughout the field of education, there are still some deficiencies in the cultivation of teachers' digital literacy. According to the five dimensions of the ' teacher digital literacy' education industry standard (Figure 1), this paper discusses five practical difficulties that hinder the improvement of teachers' digital literacy.



1.1Teachers ' digital consciousness is weak.

The 'Teacher Digital Literacy' industry standard (hereinafter referred to as the 'industry standard') is a standard issued by the Ministry of Education of the People 's Republic of China to help teachers improve their digital literacy in the information technology era. It aims to improve the standard system of education informatization, promote the national education digitization action, and enhance teachers' awareness, ability, and responsibility to optimize, innovate, and change education and teaching activities by using digital technology. However, since the promulgation of the industry standard, it has not received the attention of most teachers.

First of all, teachers do not have a good digital understanding. In the industry standard, digital understanding refers to teachers' understanding of the value of digital technology in economic, social and educational development, as well as the understanding of new problems that may arise in education and teaching, including understanding the value of digital technology in economic, social and educational development, as well as understanding the opportunities and challenges brought by the development of digital technology to education and teaching. Many teachers are busy with teaching and preparing lessons, and will ignore the reading of policy documents. Schools will not organize teachers to read and discuss in a unified way, resulting in many teachers do not understand new policies and concepts, nor can they conduct in-depth analysis and accurately grasp(Zhao Dan,2024).

In addition, teachers' willingness to digitize is not high. In the industry standard, the willingness to digitize is the teacher's attitude towards digital technology resources and their application in education and teaching, including the willingness to actively learn and use digital technology resources and the initiative to carry out digital practice, exploration, and innovation. There are many front-line teachers who are not strongly willing to carry out digital training. Most teachers believe that generative artificial intelligence is used in disciplines related to it or related to it, such as mathematics, computers, and other disciplines, and the disciplines taught are not greatly related to artificial intelligence. It does not matter; it does not delay teaching, so they will ignore the knowledge and skills in this area(Duan Lijing et al.,2024).

Furthermore, teachers ' digital will is not strong. If teachers have a strong sense of digitization, when they encounter problems in digital education, they have the belief to actively overcome difficulties and solve problems, including the confidence and determination to overcome the difficulties and challenges encountered in the practice of digital education. However, in fact, many teachers' digital will is not strong. In teaching, they think that completing their own teaching tasks is the top priority, and they will not spend extra time learning how to use and repair digital equipment. For example, when the multimedia in the classroom is faulty, many teachers' first idea is not to check the equipment themselves, but to call the logistics department for maintenance, which will not only waste class time, but also disrupt teachers ' teaching progressFinally, some senior teachers also hold conservative views on digital reform. There are many teachers who oppose the intervention of artificial intelligence in teaching. They believe that education is a subject of cultivating people, so people need to educate and shape people. Computers do not have human emotions, and only teachers impart attitudes and values in education to students. Handing teaching to machines or computers may complicate the behavior of education. Therefore, many teachers

believe that the traditional teacher-student teaching-acceptance teaching is more suitable for school teaching. As a result, teachers ' awareness of digital literacy training is weak.

1.2 Teachers ' digital skills are not good.

Digital skills refer to the ability of teachers to use intelligent technologies, such as big data technology, generative artificial intelligence technology, and other auxiliary teaching technologies. Most of today's teachers will use Hiwo whiteboard, PPT, and other software to help themselves in teaching. However, many teachers will only use the basic functions of these devices, such as the Hiwo whiteboard, only for simple page turning or writing, for some complex but useful functions, such as the split screen display of the whiteboard, the linkage with the mobile device, etc. (Feng, L.et al.,2024). The function of the screen is unknown, and it can not be successfully completed when these functions are needed in the teaching process. For some senior teachers, they are exposed to these electronic products too late, and some teachers do not know how to use them, and will not easily take the initiative to learn how to use these intelligent products, resulting in these intelligent products not play their value.

In addition, some teachers' digital application management ability is also very limited. In the era of intelligence, many schools have their own school website and educational system, can more easily view the various information of the school. However, in the operation of some educational administration management systems, most teachers will only perform some simple course schedule viewing and score entry, and will not use the data analysis and other functions in the system to analyze the student's performance change trend, course popularity, and other information. It is difficult to optimize and adjust the course according to the data. All these show that teachers lack digital knowledge and skills, and it is difficult to effectively play the real role of intelligent technology.

1.3 Teachers ' digital application is poor

At the application level, many teachers simply think that using PPT, teaching videos, and so on is to apply digitalization to the classroom, but not so. In teaching design, many teachers only use PPT and simply transfer offline courses to online, and do not set up appropriate online interaction links and learning feedback mechanisms. In the implementation of teaching, the teacher s teaching method is too single, directly explain the knowledge, will not observe the students' feedback messages, no sense of interaction, nor will they use the interactive tools of the platform to adjust the teaching rhythm in time, resulting in students' difficulty in understanding a certain knowledge point, or even deserting. For the evaluation stage of education and teaching, when evaluating students ' learning outcomes, it still mainly relies on traditional examinations and homework correction methods, and rarely uses online test platforms to evaluate students in a variety of ways. In the evaluation of students' classroom performance, it is only scored through subjective impressions. (Flores-Vivar et al.,2023)The lack of classroom interaction software to record the number of students' participation and the number of speeches will make the evaluation results not objective and accurate enough. Finally, when giving students feedback on learning, teachers mainly write comments on homework books, give oral feedback in class, or score students' homework, and do not make full use of digital tools such as e-mail and learning management system for detailed and timely feedback.

1.4 Teachers' awareness of digital responsibility is weak.

The protection of students' privacy has always been the focus of attention of schools and teachers. Nowadays, in the information age, information leakage seems to be widespread, which will make the concept of privacy of teachers and students weaker, and make it possible for criminals who use intelligent technology to steal privacy. First, data privacy may not be fully considered when collecting and using student data. For example, after using some online teaching platforms to collect information such as students' home address, contact information, etc., teachers do not take sufficient security measures to protect this data, such as unencrypted storage, random transmission of data in an unsafe network environment, etc. The management of data access rights is not strict, and data containing students' sensitive information may be shared with unauthorized personnel. It increases the risk of students' personal information leakage. In addition, some teachers' legal concepts are insufficient, and they may unintentionally infringe on others' intellectual property rights in the use of teaching resources (Lai, C., & Shi,

Z. 2025).This kind of behavior not only violates the laws and regulations related to intellectual property rights but also sets a bad example for students. In the teaching process, teachers also rarely emphasize the importance of data security to students, resulting in students' lack of self-protection awareness in the network environment. For example, teachers do not teach students how to avoid leaking their account passwords when using online learning tools, nor do they remind students to pay attention to personal data security issues, such as preventing online fraud.

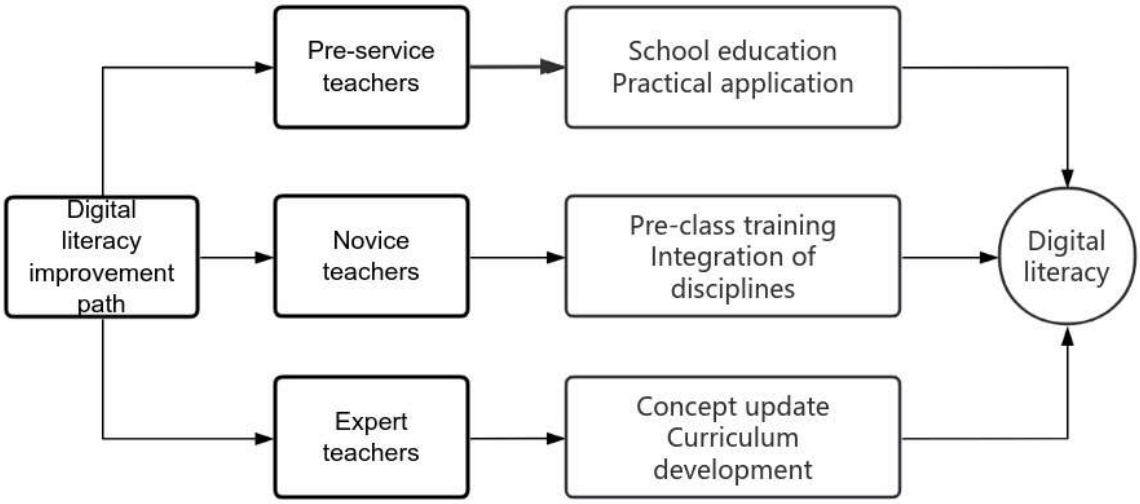
1.5 The digital development of teachers is stagnant

Teachers' professional development is very important for improving teachers' teaching ability. Due to the different times, the direction of teachers' professional development is also different. In the era of digital intelligence, teachers should realize their own development in the direction of intelligent information, but some teachers will still resist or ignore intelligent technology. Such as the emergence of a new generation of intelligent interactive devices, virtual reality (VR), and augmented reality (AR) teaching equipment, some teachers may choose to ignore these new technologies because they are accustomed to traditional teaching equipment or are afraid to learn the operation methods of new equipment(Bülbül et al.,2025). For new mobile learning devices, such as e-schoolbags, teachers may not be able to recognize their advantages in learning anytime and anywhere, and do not actively explore how to use these devices to serve teaching, resulting in students losing the opportunity to use mobile devices to expand learning. In addition, in the face of emerging teaching models, such as online courses, blended learning, and flipped classrooms etc., teachers may lack curiosity and desire to explore. They are not willing to spend time studying the characteristics and advantages of these models, nor try to integrate them into their own teaching practice. For example, the flipped classroom requires students to learn independently by video or other means before class, discuss and solve problems in class, but teachers may feel that this model is too complex and are unwilling to change their classroom teaching structure. This will lead to the stagnation of teachers ' digital professional development.

II. Strategies for improving teachers' quality

Based on the policy background and practical requirements, it is imperative to improve the quality of teachers. In the context of the digital age, the digital transformation of education has put forward new requirements for teachers at different stages. Based on this, this paper will propose strategies to improve teachers' digital literacy according to the three stages of teachers' professional development.

This paper divides the professional development of teachers into three stages:pre-service teacher development stage-novice teacher development stage, and expert teacher development stage. As shown in Figure 2, a three-level teacher digital literacy cultivation model is established.



2.1 Pre-service teachers : carry out educational practice in combination with school education

Pre-service teachers refer to normal students who have not yet officially become teachers, and still have professional subject knowledge and educational knowledge in school. In the process of learning theoretical knowledge, schools can set up theoretical courses related to improving teachers ' digital literacy according to actual needs, so that pre-service teachers can fully understand what dimensions digital literacy contains. Pre-service teachers can also use various online learning resources to actively learn knowledge and skills of educational technology, professional courses, and academic frontiers, and enrich their professional qualities(Chu, J. et al.,2023). In the process of practical application, pre-service teachers can make full use of theoretical guidance to guide practice, use various online resources to design courseware related to their own profession, share their own design ideas in the classroom, and improve the teaching design ability of pre-service teachers; in addition, pre-service teachers can also use digital technology to record students' performance in the classroom during the internship in primary and secondary schools, analyze questionnaires, study the current status of primary and secondary school curriculum, and contribute to updated theoretical research for the academic community.

2.1 Novice teachers: promote the integration of digital literacy and disciplines in professional training

In the early stages of their careers, some teachers may not yet know how to pass on their theoretical knowledge to students. Therefore, many schools will carry out pre-service training, the purpose is to help novice teachers quickly become competent positions. This requires teachers to actively and seriously participate in various lectures, absorb advanced educational concepts, carefully observe the classroom of expert teachers, and learn how other expert teachers apply intelligent technology to the disciplines they teach. In addition, we should also actively cooperate and communicate with other teachers to explore how to integrate emerging technologies such as generative artificial intelligence into the classroom(Yang, L.et al.,2022). We should also try to integrate it with the disciplines we teach, design more intelligent and digital teaching resources, and use them in the classroom, observe the classroom situation, and adjust the teaching strategies in time. For example, in the history major, historical scenes and historical figures can be reconstructed using VR / AR and other technologies to make students immersive and stimulate students ' interest in learning. Finally, teachers should also innovate teaching modes, such as adopting a flipped classroom or blended teaching mode, so as to make the classroom more digital and intelligent.

2.3 Expert teacher:to realize the development of digital courses in the renewal of ideas

Expert teachers have been very skilled in how to carry out classroom teaching. In addition to the quality of ordinary teachers, they must also have the quality of educational research. Therefore, they should first innovate their traditional educational concepts, and organize and carry out digital literacy training workshops for teachers, such as teaching design competitions, digital technology knowledge quick answers, etc., to help the entire teacher team improve their digital literacy level. Expert teachers should also take the lead in setting up a teaching resource library to realize the sharing of teaching resources in various regions, integrate excellent teaching resources and teaching cases in various disciplines, and promote the sharing of teacher resources in different regions(Yang, L.et al.,2023). Finally, expert teachers should also actively participate in educational research projects, study the latest educational trends and educational technology practices at home and abroad, and develop digital courses that are more suitable for the digital age. In cooperation and exchange with countries and enterprises, we will apply the latest technology pilot to the field of education and promote the innovative development of its educational technology.

III. Conclusion

The era of digital intelligence not only brings new opportunities to the field of education but also brings new challenges. As the core element in the relationship between 'teaching and learning', it is an inevitable trend for teachers to improve their digital level. Teachers should always track the latest digital technology trends, deeply integrate them into educational practice, and help accelerate the transformation of China 's educational digitization.

REFERENCE

[1] Feng Hu, Construction and Implementation of School-Based Professional Development Pathways for Enhancing Teachers' Digital Literacy. Primary Education Teaching Reference, 2024(36): pp. 74-77.

[2] Zhao Dan, Standardized Assessment of Digital Literacy among University Teachers in the Context of Educational Digitization. China Standardization, 2024(24): pp. 247-249.

[3] Duan Lijing, Luo Yuqi and Luo Zelong, Analysis of the Cultivation Pathways of Digital Literacy for University Teachers in the Context of Educational Digital Transformation. China Management Informatization, 2024.27(24): pp. 220-222.

[4] Feng, L., Sumettikoon, P. An empirical analysis of EFL teachers' digital literacy in Chinese higher education institutions. Int J Educ Technol High Educ 21, 42 (2024).

[5] Flores-Vivar, J., & García-Peñalvo, F. (2023). Reflections on the ethics, potential, and challenges of artificial intelligence in the framework of quality education (SDG4). [Reflexiones sobre la ética, potencialidades y retos de la Inteligencia Artificial en el marco de la Educación de Calidad (ODS4)]. Comunicar, 74, 37-47.

[6] Lai, C., & Shi, Z. (2025). Teachers' digital initiatives to bridge students' in-class and out-of-class language learning and the influencing factors. British Journal of Educational Technology, 56, 2595–2622.

[7] Bülbül, A.E., Özelçi, S.Y. The mediating role of mobile learning motivation in the relationship between pre-service teachers' digital literacy and pre-service teacher identity. Educ Inf Technol 30, 1729–1743 (2025).

[8] Chu, J., Lin, R., Qin, Z. *et al.* Exploring factors influencing pre-service teacher's digital teaching competence and the mediating effects of data literacy: empirical evidence from China. *Humanit Soc Sci Commun* **10**, 508 (2023).

[9] Yang, L., Martínez-Abad, F. & García-Holgado, A. Exploring factors influencing pre-service and in-service teachers´ perception of digital competencies in the Chinese region of Anhui. Educ Inf Technol 27, 12469–12494 (2022).

[10] Yang, L., García-Holgado, A. & Martínez-Abad, F. Digital competence of K-12 pre-service and in-service teachers in China: a systematic literature review. Asia Pacific Educ. Rev. 24, 679–693 (2023).