Education Reform and Development, 2026, Volume 8, Issue 3
https://ojs.bbwpublisher.com/index.php/ERD
Online ISSN: 2652-5372
Print ISSN: 2652-5364

Exploring the Pathways for Cultivating Teachers' Digital Literacy through Educational Technology in the Era of Intelligence

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Abstract: Today, with the deep integration of digital technologies such as artificial intelligence and big data into the field of education, the digital transformation of education has become the core engine driving the high-quality development of education. As a key support for the implementation of educational digitalization, teachers' digital literacy directly determines the effectiveness of educational technology application and the depth of educational reform. Based on this, this paper conducts research on the pathways for cultivating teachers' digital literacy empowered by educational technology in the era of intelligence, sorts out the current existing problems, analyzes the important value of teachers' digital literacy cultivation, and explores practical cultivation pathways. It aims to provide theoretical reference and practical enlightenment for improving teachers' digital literacy and promoting the digital transformation of education.

Keywords: Era of intelligence; Educational technology; Teachers' digital literacy; Cultivation pathways; Educational digitalization

Online publication: April 10, 2026

1. Introduction

With the introduction of policies such as the "Education Informatization 2.0 Action Plan" and the "Framework for Teachers' Digital Literacy," digital literacy has become a core competency for teachers' professional development in the new era, and an important prerequisite for teachers to adapt to the digital and intelligent transformation of education. Educational technology in the era of intelligence has broken the time and space limitations of traditional education, reconstructed teaching processes and teacher-student relationships. From the construction of smart classrooms to the accurate analysis of educational data, higher requirements have been put forward for teachers' digital application and innovation capabilities. As organizers of education and teaching, teachers' digital literacy level directly affects the quality of integration between educational technology and subject teaching, and even determines the process of educational digital transformation [1]. As the core carrier for empowering teachers' digital literacy cultivation, educational technology can provide technical support and method innovation for

teachers to improve their digital literacy. Therefore, in-depth exploration of its existing problems, important value and implementation pathways is of great significance.

2. Existing problems in cultivating teachers' digital literacy empowered by educational technology in the era of intelligence

2.1. Imperfect cultivation support system

Currently, teachers' digital literacy cultivation lacks systematic support, resulting in poor overall promotion effects. On one hand, policy implementation is not in place. Some regions have not issued special plans and detailed rules, and the definition of training goals, pathways, and division of responsibilities is unclear. Digital education is simply equated with technical skills training, lacking long-term planning, and the "fragmentation" phenomenon is obvious. On the other hand, the support intensity is insufficient. Rural and remote areas face funding shortages and backward infrastructure; the teaching subjects are mostly university experts and technical personnel who lack practical experience, leading to poor integration of theory and practice; most schools do not have specialized management institutions or full-time personnel, resulting in weak coordination capabilities.

2.2. Single training content and methods

Problems exist in the design and implementation of training content, leading to poor cultivation effectiveness. In terms of content, the curriculum setup mostly focuses on the indoctrination of basic theoretical knowledge, failing to fully consider the actual needs of teachers at different career development stages and achieve accurate correspondence; a unified standardized teaching model is adopted, making it difficult to meet the diverse personalized development needs of young, middle-aged, and elderly teachers. In terms of teaching methods, traditional face-to-face classes are still the main form, lacking the auxiliary support of digital technology. Online education mostly adopts recorded broadcasting, lacking opportunities for interactive communication; more emphasis is placed on explaining theories while ignoring the arrangement of practical operation links, resulting in poor transformation of learning outcomes into actual work scenarios and affecting the achievement of digital literacy training goals.

2.3. Insufficient resource integration

Current educational technology resources face problems such as "decentralization, homogenization, and uneven regional distribution". Existing educational resources are relatively scattered, lacking a mechanism for systematic integration and collaborative sharing. Frontline teachers spend time and effort to obtain high-quality teaching materials, and there is also duplication of construction. Although cities and key campuses gather many resources, rural and remote areas are difficult to obtain support due to lack of funds and technical facilities, leading to an increasing gap in digital literacy between urban and rural areas; some resources have similar content, lacking innovation and personalized characteristics, unable to accurately meet the diverse needs of various disciplines, and the overall use efficiency needs to be improved.

3. Important value of cultivating teachers' digital literacy empowered by educational technology in the era of intelligence

3.1. Helps promote teachers' professional development

As a key component of teachers' core competencies in the new era, digital literacy provides key support for

educational technology to promote teachers' professional development. Through online learning platforms, intelligent teaching and research tools, etc., teachers can quickly master digital teaching practice skills, improve critical thinking and innovation capabilities; at the same time, it encourages teachers to break through traditional cognitive limitations, establish modern information-based education concepts, thereby realizing the transformation from "experience-based" teachers to "intelligent and innovative" teachers, enhancing teachers' professional competitiveness, and meeting the development needs of educational modernization [2].

3.2. Helps optimize educational teaching models

Teachers with high digital literacy can use intelligent technology to improve teaching operations. For example, using big data analysis tools to comprehensively evaluate students' learning situations, thereby formulating personalized learning plans to achieve differentiated teaching; creating immersive teaching scenarios with virtual reality technology to enhance students' enthusiasm; implementing hybrid teaching models through online platforms, which greatly improves classroom interaction efficiency and knowledge transfer effectiveness, promotes the transformation of traditional evaluation systems towards digitalization, achieves multi-dimensional and accurate evaluation goals, and thus overall improves the quality of education and teaching [3].

3.3. Helps promote the digital transformation of education

Teachers' digital literacy is a core element of the digital transformation of education. The improvement of their level is related to the success of the integration of technology with education and teaching. Improving the information literacy of teachers can enable intelligent technology to be widely used in various educational application scenarios such as teaching and training, promoting the modernization and intelligence of education; it is conducive to improving the allocation of educational resources, narrowing regional differences, and safeguarding educational equity; it helps cultivate teachers' innovation and practical awareness and capabilities, transport high-quality talents for social operation, further improve the education ecosystem, and contribute to the construction of a modern education system, that is, advancing education towards a stage of high-quality development [4].

4. Implementation pathways for cultivating teachers' digital literacy empowered by educational technology in the era of intelligence

4.1. Establish a digital literacy cultivation support system and integrate educational technology resources

A sound support system and high-quality resource supply are the foundation for teachers' digital literacy cultivation. Schools should build a systematic cultivation support system, integrate various educational technology resources, and provide strong support for teachers' digital literacy cultivation. First, strengthen policy guidance. Schools should formulate targeted supporting plans and implementation rules in accordance with national strategic deployments, systematically set the goals, content framework, implementation pathways, and division of responsibilities for teachers' digital literacy cultivation, and incorporate them into the overall planning of educational undertakings for coordinated arrangement to ensure the scientific and standardized advancement of training activities. A sound supervision and evaluation mechanism should be established to ensure the implementation of relevant policies, and dynamic monitoring and performance assessment should be used to urge all regions to truly fulfill their responsibilities and achieve coordinated development [5]. Second,

increase fund investment and improve hardware guarantees. Schools should focus on promoting the construction of educational informatization infrastructure, the introduction of high-quality digital educational resources, and teacher training projects, strive to improve the level of equipment configuration, establish a diversified fund-raising mechanism, fully mobilize the enthusiasm of school-enterprise cooperation and social donations, and provide stable financial support and development motivation for teachers' digital literacy cultivation [6]. Third, integrate educational technology resources and realize resource sharing. Schools should establish a collaborative sharing system for educational technology resources, promote in-depth cooperation among multiple subjects, and integrate core elements from universities, research institutions, enterprises, schools, etc.; create a unified digital literacy cultivation platform to achieve cross-domain data interconnection and efficient application; improve resource allocation, design personalized and customized high-quality content according to the characteristics of different disciplines and the differences in teachers' development needs, avoid resource idleness, improve overall utilization efficiency, and ensure the fair coverage of high-quality educational resources for teachers and students at all levels [7].

4.2. Set diversified digital literacy cultivation methods and promote the integration of training and practice

Innovative training models are regarded as important pathways to improve teachers' digital literacy. Schools should design diverse, flexible and practical cultivation plans to achieve the true integration of theoretical learning and practice, and truly realize "learning for application and application through learning" [8]. First, implement a hybrid cultivation model. Schools should integrate online and offline resources, design a training system including independent learning, centralized seminars, and remote feedback, provide recorded courses, real-time lectures, and online Q&A through digital platforms, and guide teachers to arrange independent learning according to their own needs; carry out special lectures, scenario simulations, case analyses and other activities, use online experts to solve practical problems, improve professional levels, encourage teachers to share experiences and insights through social tools, promote two-way interaction between online and offline, deepen teaching impressions, and achieve all-round development [9]. Second, adopt a combination of case teaching and practical exercises. Schools should summarize the successful experiences and existing problems of teachers at all disciplines and levels in the integration of educational technology, conduct in-depth analysis during courses, organize students to exchange experiences and summarize lessons, and guide teachers to formulate improvement plans in combination with their own actual situations; set up special training bases, equipped with advanced information technology support equipment, to create an immersive experience environment for teachers, allowing them to actually operate various intelligent tools in virtual scenarios and participate in the complete teaching design and display process, achieving the goal of transitioning from vague understanding to specific skills and comprehensively improving digital literacy levels. Third, build a smart teaching and research platform to promote teachers' mutual growth. Relying on modern information technology, schools should create digital teaching and research venues that support various interactive activities such as collective lesson preparation, mutual evaluation, discussion and analysis, case sharing, and project research, and promote the formation of collaboration and resource sharing mechanisms within professional communities; adopt cross-regional joint methods to achieve the integration of heterogeneous resources—teachers from different regions and disciplines participate across borders, deepen the integration of teaching concepts, encourage frontline teachers to present information-based teaching achievements online, and conduct in-depth discussions on the successful elements and improvement methods in practice, thereby stimulating creativity and improving digital skills [10].

4.3. Improve the incentive mechanism for teachers' digital literacy and stimulate teachers' application motivation

Sufficient motivation is the key for teachers to actively improve their digital literacy and actively use educational technology. Schools should improve the incentive mechanism for teachers' digital literacy to encourage teachers to take the initiative to improve their digital literacy. First, establish and improve the spiritual incentive mechanism. Schools can carry out activities such as digital literacy competitions, excellent case evaluations, and digital teaching skills competitions, commend those with outstanding performance, issue honorary certificates or medals and other material rewards, highlight their significant contributions and play a leading and exemplary role, create a strong atmosphere of "learning from each other and striving for excellence", and further stimulate teachers' willingness and sense of responsibility to actively improve their digital capabilities [11]. Second, improve the material incentive mechanism. Schools should provide corresponding rewards to teachers who perform well in digital teaching operations and have obvious achievements in the application of educational technology, such as bonuses or subsidies for teaching equipment procurement, include educational technology capabilities in the scope of performance assessment with an important weight, thereby tilting professional title evaluation and selection and commendation towards teachers with high-level digital skills, and further stimulating the learning enthusiasm and development potential of all faculty and staff [12]. Third, establish a professional development incentive mechanism. Schools should incorporate digital literacy cultivation into the framework of professional development plans, support teachers to participate in scientific research projects, online training, academic exchanges and other activities; build a digital capability training platform to encourage teachers to explore new models of integrating information technology with subject teaching, and implement special support measures for teachers with outstanding performance to promote their continuous progress and ensure the sustainable development of their careers [13].

4.4. Construct an evaluation system for teachers' digital literacy and conduct diversified evaluation of application capabilities

Schools should establish a diversified and systematic evaluation framework, focusing on reflecting the guiding role of evaluation goals, the attention to individual differences, and the value orientation of practical application, thereby mobilizing teachers' enthusiasm to actively improve their digital capabilities. First, clarify evaluation indicators. Combined with the development needs of education in the era of intelligence and the actual teaching situation of teachers, schools should clarify the evaluation indicators of teachers' digital literacy, focusing on core dimensions such as digital awareness, digital application, digital innovation, digital reflection, and digital security, with each dimension refined into specific evaluation points. For example, the digital application dimension includes educational technology operation capabilities, smart classroom design capabilities, educational data application capabilities, etc.; the digital innovation dimension includes the ability to integrate and innovate educational technology with subject teaching, the ability to develop digital teaching resources, etc., ensuring that the evaluation indicators are scientific, comprehensive, and specific, and can accurately reflect teachers' digital literacy levels [14]. Second, strengthen the application of evaluation results. Schools should establish a feedback mechanism and application system, promptly transmit evaluation information to educators, help them identify strengths, analyze shortcomings, and formulate suitable improvement plans, and promote the continuous improvement of digital literacy through special training; incorporate evaluation results into core elements such as performance assessment, professional title evaluation, and career planning, highlight the value-

oriented significance of evaluation, and encourage teachers to actively participate in digital learning to achieve professional growth goals. At the same time, encourage teachers to actively participate in the evaluation process, provide feedback on evaluation opinions and suggestions, continuously improve the evaluation system, and enhance the scientificity and practicality of evaluation [15].

5. Conclusion

In summary, in the era of intelligence, the cultivation of teachers' digital literacy is an important measure to promote the digital transformation of education. Although it faces many problems, it has also ushered in good development opportunities. As a core empowering carrier, educational technology can provide technical, resource and method support for cultivation work. Therefore, colleges and universities should strengthen the training and guidance of teachers, focus on exploring empowering pathways from four dimensions: support system, cultivation methods, incentive mechanism, and evaluation system, aiming to solve cultivation difficulties and promote the improvement of teachers' digital literacy. In subsequent work, schools should continuously improve the cultivation system and innovate methods, promote the in-depth integration of educational technology and cultivation work, and assist teachers' professional growth.

Disclosure statement

The author declares no conflict of interest.

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