



Research on Paths of Artificial Intelligence-Empowered Education for Elderly Care Service Practitioners

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Abstract

With the continuous deepening of population aging in China, talent education for elderly care services is confronted with a prominent imbalance between talent supply and demand, structural misalignment, homogenization of course content, and weak teaching effectiveness. With its powerful data processing, personalized services, and intelligent decision-making capabilities, artificial intelligence (AI) offers new opportunities for solving traditional training problems and promoting the reform and innovation of talent education. Based on clarifying the value of AI in empowering the education of elderly care service talents and its role positioning as an “innovator, manager, and evaluator”, this article analyzes the current practical challenges: the shortage in the quantity of supply, the imbalance in the allocation of resources between urban and rural areas, the disconnection between course content and the demands of intelligent elderly care, the single teaching mode, and the risks of “filter bubbles” and the weakening of value rationality in the application of technology. It then puts forward practical paths: a shift from “simple technological superposition”

to “deep integration”; in terms of courses, building an intelligent curriculum system that integrates “job, course, competition, and certificate”; in teaching, carrying out online–offline blended and virtual immersive teaching; in terms of teachers, creating a diverse and collaborative “dual-qualified teacher” team; on the platform side, building an open base that integrates on-campus training and off-campus internships; and, in terms of guarantees, improving policy guidance, diversified financing, and risk prevention mechanisms. It emphasizes that empowerment by AI should adhere to the principle of education for the people, and that future work should expand the application scenarios of generative AI and optimize the paths through empirical research to promote the high-quality development of elderly care professional education.

Keywords: artificial intelligence, education for elderly care professionals, high-quality development, integration of industry and education.

1 Introduction

In January 2026, the National Bureau of Statistics of China released the national economic data for 2025, showing that the population aged 60 and above reached 323.38 million, accounting for 23.0% of the



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total population of the country. Among them, the population aged 65 and above reached 223.65 million, accounting for 15.9% of the total population. This indicates that China has fully entered an aging society, and the profound transformation of the population age structure has become a strategic issue affecting the overall development of the country [1, 2]. In recent years, China has consistently elevated artificial intelligence to a national strategic priority, with government policy documents explicitly promoting the research and application of big data and AI across sectors, including elderly care [3].

Service practitioners in the elderly care sector are the core element supporting the high-quality development of the elderly care system. China faces a severe and widening shortage of elderly care workers. The long-term care system for older adults faces significant structural challenges in both policy design and workforce supply, with demand projected to continue rising as the population ages [4]. Forecasting studies further confirm that the nursing workforce required to serve the oldest-old population will substantially exceed current supply levels in the coming years [5]. More seriously, there are prominent problems in the current training of elderly care talents, such as the disconnection between the training goals and the industry demands, outdated and lagging curriculum systems, and insufficient depth of school-enterprise cooperation [7]. These structural gaps are further compounded by the limited integration of AI-based instructional approaches into care education, which constrains the development of digitally competent elderly care professionals [6]. Against this background, how to deeply integrate AI technology into the education of elderly care service practitioners and develop intelligent, personalized, and efficient approaches to talent cultivation has become an important issue. Drawing on recent research on AI applications in gerontological education, elderly care services, and vocational education, this study systematically examines the value and role of AI in the education of elderly care service practitioners, identifies the major challenges associated with its application, and proposes practical pathways for promoting its effective integration into elderly care education.

2 The Value Implications and Theoretical Foundation of Artificial Intelligence in Empowering the Education of Elderly Care Service Practitioners

2.1 Analysis of the Applicability of Artificial Intelligence in Enabling Elderly Care Education

In recent years, digital technologies have broadened the connotation of educational empowerment, making AI-enabled training a prevailing trend in elderly care vocational education. Globally, the U.S., Japan, Germany, and China have formed distinct development models tailored to their national conditions. The U.S. AGEC program (Arkansas Geriatric Education Collaborative), a HRSA-funded and academia-led initiative, leverages ChatGPT to synthesize content for a 40-hour advanced geriatric specialty curriculum for certified nursing assistants, with subject-matter-expert review ensuring the accuracy and clinical relevance of the AI-generated learning materials [8]. The MHLW (Ministry of Health, Labour and Welfare) model in Japan is led by the central government and builds a multi-level digital training system and a dual training loop of institutions and enterprises in response to a severe and worsening care workforce shortage. Research on the Japanese care sector indicates that high turnover rates and strong intention to leave the profession among care workers represent a structural threat to workforce sustainability [9], underscoring the urgency of policy-driven systematic investment in training and retention, and embodying the characteristics of “policy-driven + systematic”. The BMBF (Federal Ministry of Education and Research) model in Germany involves multiple collaborations among federal ministries, state governments, and enterprises, promoting VR training and the application of nursing robots through a multi-level funding system. Evidence from systematic reviews indicates that effective workforce training for long-term care typically requires a multifaceted approach that blends in-practice learning with structured implementation strategies [10]. Through a multi-level funding system, the BMBF model promotes VR training and the application of nursing robots, embodying the characteristics of “diverse collaboration + ethical embedding”. China presents a “policy leadership + scenario-driven” characteristic, with government departments clearly stating “promoting the intelligentization of related professional services in elderly care”, incorporating AI and big data into the training courses for elderly care workers, and piloting

dual skills certification for “elderly care workers + intelligent equipment operators” in multiple regions. Thus, it can be seen that the application of AI in enabling elderly care education is feasible in principle, but it requires the triangular synergy of government public welfare support, intelligent support of technical tools, and professional practice of educators [8, 11, 12].

2.2 The Value Implications of Artificial Intelligence in Empowered Education for Elderly Care Service Practitioners

2.2.1 The Strategic Need to Actively Respond to Population Aging

The accelerating aging of China’s population poses substantial challenges to the development of the elderly care workforce. Currently, there are approximately 35 million disabled elderly people in China, and this number is expected to reach 46 million by 2035 [13]. At the same time, large numbers of older adults live alone or without close family support, and the resulting demands for spiritual comfort, psychological care, and social participation have become increasingly prominent [13]. By empowering elderly care service education with AI and leveraging the new advantages of the new generation of AI in deep learning, cross-border integration, and human-machine collaboration, stakeholders can create new possibilities for expanding and improving the elderly care service talent pool.

2.2.2 Promote the Improvement and Upgrading of the Elderly Care Service Industry

Accelerating the development of the elderly care industry is a powerful means to expand domestic demand, stimulate consumption upgrading, and cultivate new growth drivers for economic development [14]. However, the current development of the elderly care industry faces fundamental problems such as low overall level, insufficient effective supply, and unbalanced development. With the continuous improvement of the industrialization level of AI and the widespread application of “AI +”, Chen et al. [15] have shown that AI technologies—including intelligent tutoring systems, adaptive learning platforms, and educational data mining—can substantially enhance the efficiency and quality of talent cultivation. By enabling personalized learning pathways and supporting data-driven teaching decisions, AI drives systematic improvements in both the process and outcomes of elderly care professional education.

2.2.3 Meet the Diversified Needs of Elderly Care Services

With the improvement of material living conditions and the progress of the times, the demands for elderly care services are undergoing profound changes. They are shifting from simple life care to diversified needs such as medical care, spiritual comfort, cultural entertainment, and social participation. This poses higher requirements for the knowledge structure and ability qualities of elderly care service professionals. Holmes et al. [16] emphasize that the application of AI in education must be grounded in ethical principles—including fairness, transparency, and human-centredness—to ensure that AI-empowered talent cultivation genuinely serves the diverse needs of learners rather than amplifying existing inequalities. Guided by this ethical framework, AI-enabled elderly care education holds the potential to transcend traditional resource and spatial constraints while maintaining its fundamental commitment to human dignity and professional values.

2.3 The Role of Artificial Intelligence in Elderly Care Service Professional Education

2.3.1 Innovator: Promoting the Innovation of Educational Concepts and Training Models

AI will break down barriers in the education of elderly care professionals and promote an extension of educational concepts toward “borderless” territory. It encourages education to place greater emphasis on people-oriented principles. Starting from three levels—knowledge model, cognitive model, and psychological model—AI precisely depicts the profiles of learners, comprehensively and dynamically presents personal qualities and overall abilities, and provides personalized learning resources and customized teaching services. At the same time, experiential teaching is increased. To address the shortage of talent in the smart health and elderly care industry, the single training model, and outdated courses, researchers have developed competency frameworks that systematically define the knowledge, skills, and professional attitudes required for gerontological nursing practice in China [17]. These frameworks provide a structured basis for aligning school-based training with actual job requirements, and highlight the need for curricula that integrate both clinical competence and humanistic care; their applicability across different institutional and regional contexts warrants further validation.

2.3.2 Manager: Facilitating the Reformation of the Education Governance Mechanism

AI possesses powerful comprehensive functions such as data processing, complex program analysis, and visual image simulation, which enable it to break away from the traditional experience-based decision-making model and support a data-driven decision-making framework involving multiple stakeholders [18]. From a macro perspective, intelligent decision-making is beneficial for enhancing the systematicness of the education planning for elderly care professionals. Based on the industry development data and trend prediction reports dynamically generated by AI, the education authorities can formulate targeted training implementation plans and coordinate the allocation of national educational resources. From a micro perspective, through the data visualization platform, managers can conduct real-time monitoring of course design, teaching arrangements, student status, and training quality, and make scientific decisions and precise control based on the improvement plans provided by the intelligent system.

2.3.3 Evaluator: Promoting the Steady Improvement of Education Quality

Educational evaluation is not only a barometer reflecting the effectiveness of education, but also a guiding baton for directing the development direction of educational work. The previous evaluation of the educational quality of elderly care service talents often focused on graduation assessment, skill tests, etc., while neglecting the data collection and information mining during the training process, resulting in evaluation results lacking objectivity and rationality. However, the AI assessment system developed by Hwang et al. [19] collects information data such as learners' learning behaviors, cognitive changes, and ability assessments from multiple aspects and throughout the process, and quantitatively assesses in multiple dimensions to achieve precise feedback. By connecting data, it strengthens skill transfer, relies on resource integration to support personalized and large-scale teaching collaboration, and provides a feasible solution for optimizing scenario-based teaching in the elderly care field, significantly improving the accuracy and comprehensiveness of educational evaluation.

3 The Realistic Challenges of Empowering Elderly Care Service Talent Education Through Artificial Intelligence

3.1 Quantity Dimension: The Contradiction Between Insufficient Supply and Explosive Demand

The scale and growth rate of the elderly population in China have both risen, and the demand for elderly care service talents has exploded. However, the current total scale of talent cultivation is insufficient, and the supply of various teaching carriers is limited [4]. Even more seriously, the talent supply structure formed by the expansion of enrollment scale does not match the market demand structure. The market requires elderly care service talents with comprehensive abilities, professional skills, and good communication skills. However, the students cultivated by vocational colleges still lack practical abilities, innovation abilities, and the ability to handle complex situations, resulting in a mismatch between supply and demand [7].

3.2 Dimension of Training Structure: Imbalance in Resource Allocation and Misalignment of Urban and Rural Regional Demands

The imbalance in the distribution of human resources and educational resources for elderly care services is significant in China. Most high-quality resources are concentrated in cities, while rural areas are resource-poor [20]. At the same time, the demand for elderly care services in rural areas is growing rapidly, which further exacerbates the imbalance between urban and rural areas. From the perspective of regional distribution, the establishment of elderly care-related majors is relatively more common in economically developed regions with large aging populations, while there are few such majors in the central and western regions and rural areas, resulting in a significant mismatch between the training capacity and the local demand for elderly care services. AI technology does not benefit every individual fairly and equally. High-cost intelligent equipment, insufficient elderly-friendly applications, and complex operation interfaces have deprived some learners of opportunities, creating a new intelligent gap [21].

3.3 Dimension of Course Content: Homogenized Supply and Mismatch of Diversified Demands

The proportion of "new elderly" has increased, and the demand for elderly care services is gradually shifting toward diversification and high quality. This

has raised higher requirements for the knowledge structure and ability qualities of elderly care service practitioners [22]. However, the current problem of homogenized training content is prominent. The courses are mainly focused on basic nursing and daily care, with emerging fields such as smart elderly care technology remaining significantly underrepresented in existing curricula. This has failed to keep up with the latest developments and demands in the elderly care industry [23]. The system and coherence of course settings are insufficient, and there is a phenomenon of overlap in course content, making it difficult for students to form a complete knowledge chain during their studies [24]. At the same time, the proportion of practical courses is relatively low, leaving students with insufficient practical operation opportunities [7].

3.4 Teaching Effectiveness Dimension: Insufficient Adaptation of Resources to Learners' Specificities

The traditional teaching model neglects the physiological and behavioral characteristics of the learners in the field of elderly care services. The teaching resources lack adaptation to elderly-friendly and learner-friendly aspects, and the acquisition process is cumbersome [24]. Some course designs do not take into account the physical conditions and living habits of the learners, resulting in insufficient accessibility of resources in terms of time and space dimensions and low utilization rates. In terms of teaching methods, the traditional lecture-based approach still predominates, lacking interactivity and innovation, and failing to fully stimulate students' learning potential and innovative thinking. In terms of school-enterprise cooperation, the depth and breadth are insufficient, and the enterprises' participation in the talent cultivation process is low, with a single form of cooperation [7].

3.5 Technology Application Dimension: Risks of "Technological Worship" and Weakening of Value Rationality

Under the influence of the traditional technological worship mindset, intelligent technology has become the focus of solving various problems in the education of elderly care service practitioners. Educational technology has been "objectified" as an indispensable tool in educational activities, and the educational value concept has deviated [25]. On one hand, there is an overstepping of instrumental rationality, focusing only on the technical attributes of educational products or platforms while neglecting their educational

attributes. On the other hand, there is a weakening of value rationality: if AI is allowed to dominate the development of education, it will reduce the possibility of differentiated development in talent cultivation and invisibly obscure the true meaning and intrinsic value of education. In addition, the "filter bubble" effect leads to homogenized and single absorption of educational content, and algorithm recommendations cause learners to sink into a relatively closed and confined educational space [26].

4 The Practical Pathways for Empowering Elderly Care Service Practitioners' Education with Artificial Intelligence

4.1 Conceptual Transformation: Achieving a Shift from "Simple Technological Superposition" to "Deep Integration"

Empowering the education of elderly care service practitioners with AI is not merely a simple addition of technology or empowerment through tools; it represents a profound and systematic transformation [27]. This transformation requires a leading role of conceptual innovation, fundamentally resolving the inherent contradictions in traditional talent cultivation regarding resource supply, service coverage, and precise adaptation.

4.1.1 Establishing the Principle of Problem-Oriented Approach

The transformation of AI from an auxiliary tool to the core engine of the entire elderly care service practitioners' education ecosystem cannot be achieved without the guiding principle of "problem-oriented". Traditional talent cultivation is limited by the shortage of resources and the fixed distribution of resources. "AI + Elderly Care Service Practitioners' Education" utilizes online platforms and digital and modular resources to break through time and space limitations, achieving low-cost and large-scale coverage of high-quality educational content, effectively filling the gap in resource quantity.

4.1.2 Adhering to the Principles of Precision and Personalization

AI mainly utilizes computing power, algorithms, and data to simulate human intelligent processing. Algorithm analysis can not only precisely deliver high-quality educational resources to resource-poor areas but also precisely deliver educational resources to specific learners, improving the accuracy, personalization, and fairness of resource allocation. This effectively addresses the problem

of regional mismatch in talent cultivation resources and the problem of resource delivery to different individuals with varying knowledge needs, achieving a fundamental transformation from “universalization” to “personalization”.

4.1.3 Adhering to the Principle of Adaptability

The principle of adaptability requires that “AI + elderly care talent education” should not mechanically provide educational services or passively wait for the expression of demands, but should actively explore and analyze the real learning needs of learners [12]. AI can employ algorithms to classify resources by difficulty and precisely match them with the different learning needs of learners with different acceptance abilities, knowledge bases, and cognitive levels, thereby constructing a variable knowledge system and a personalized demand adaptation mechanism. This new training model not only follows the laws of vocational education but also embeds learning activities in actual working scenarios, and further bridges the digital gap between learners and AI technology [11].

4.2 Curriculum System Reengineering: Achieving the Transformation from “Traditional Monotony” to “Intelligent Diversity”

4.2.1 Add Courses Related to Artificial Intelligence

In line with the development trends of the AI industry, the professional talent training system should add special course modules such as AI fundamentals, practical operation of intelligent elderly care equipment, and processing and analysis of elderly care big data [6]. Through systematic coursework and practical training, students can master the underlying principles of AI, the operation and maintenance of elderly care intelligent equipment, and the skills of data mining and analysis for elderly health, and be able to provide decision support for the formulation of personalized elderly care plans based on data results. Integrating AI-related content into the professional curriculum of elderly care can not only meet the digital technology learning needs of students and narrow the digital gap in the elderly care field, but also precisely respond to the diverse and high-quality care service demands of the elderly population in the industry.

From an international critical perspective, the integration effect of AI and elderly care cannot be achieved solely through technological hardware. The education system is the core carrier for ensuring the implementation of AI ethics, achieving inclusiveness,

and providing scenario-based intelligent elderly care services. The cases of elderly care talent cultivation in Japan, Finland, India, and South Korea have confirmed that the implementation effectiveness of intelligent elderly care depends more on the innovative design of talent education than on the advanced level of AI technology itself. Without a complete and adaptable talent education system oriented toward human care, even the most advanced intelligent technology will be unable to achieve dignified and humane elderly care, which also highlights the necessity of synchronously embedding AI technology application and human ethics teaching in the curriculum system [26].

4.2.2 Integrate Interdisciplinary Knowledge and Skills

Integrate knowledge and skills from multiple disciplines such as medicine, nursing, psychology, sociology, and information technology, guided by job tasks. Optimize the curriculum system, integrate and sequence teaching content, and construct a “job–course–competition–certificate” integrated curriculum system based on job competency, focusing on cultivating students’ interdisciplinary thinking and comprehensive application abilities [12]. Drawing on international experience, the integration of AI tools and subject-matter-expert review into curriculum development can further enhance the accuracy and clinical relevance of training content for elderly care professionals [8]. According to the development status of AI technology and industry demands, adjust and optimize the curriculum system in a timely manner, integrate AI technology into traditional courses, enrich teaching methods, and optimize teaching effects.

4.2.3 Curriculum Development Based on Work Processes

Based on the actual working process of elderly care services, starting from aspects such as the assessment of the elderly’s abilities, daily care, the application of AI technology, rehabilitation training, and psychological counseling, the courses are developed and designed [12]. During the process of completing tasks, students acquire the qualities, knowledge, and skills necessary for actual work, thereby improving their job competence. When developing digital educational resources, the characteristics of learners should be grasped, with practical value as the action base for resource construction, and quality as the standard for resource construction [24].

An overseas empirical study developed an adaptive learning platform embedded with AI chatbots

targeting behavioral and psychological symptoms of dementia (BPSD). The researchers recruited 58 caregivers from five nursing homes in South Korea and conducted a single-blinded quasi-experimental study. The results showed that the experimental group using the personalized adaptive system was significantly ahead in terms of professional knowledge, care competence, self-efficacy, and platform satisfaction. Moreover, 75% of the users made use of the customization features to adjust the learning content, supporting the added value of AI-based adaptive digital courses for the cultivation of elderly care talents [28].

4.3 Innovation of Teaching Modes: Transform from “Teaching and Implantation” to “Intelligent Interaction”

4.3.1 Utilizing Project-Based Teaching and Case Teaching Methods

Teachers can adopt project-based learning and introduce authentic elderly care cases to guide students in conducting in-depth analyses and discussions, and allow them to participate in designing intelligent elderly care community plans and developing elderly health management apps, thereby enhancing students' ability to solve practical work problems and cultivating innovative thinking [29]. By utilizing information-based teaching methods such as virtual simulation training platforms, teachers can simulate various elderly care scenarios and allow students to operate and train in a virtual environment, thereby improving their practical operation skills and the ability to handle complex situations. Wang et al. [30] addressed the issue of a shortage of elderly care nurses in the United States and explored the application of intelligent immersive virtual reality (IIVR) in elderly care training. Through six simulation scenarios, the results of two-stage verification showed that the effectiveness of the IIVR tool exceeded the “acceptable” level, and the cognitive load of the participants was lower than that of traditional learning methods. This empirical study provided evidence supporting the effectiveness of virtual simulation training in the education of elderly care talents.

4.3.2 Conduct Online and Offline Hybrid Teaching

Combine online teaching with offline teaching. Online teaching is conducted through online platforms for imparting theoretical knowledge, discussions, and assignment distribution. Offline teaching involves practical operations, group discussions, and face-to-face guidance [6, 12]. Teachers can

flexibly adjust teaching content and pace based on students' learning situations and feedback, providing personalized learning suggestions and guidance. Online teaching utilizes AI learning platforms to offer abundant learning resources and personalized learning guidance. Offline teaching through face-to-face communication and practical activities strengthens students' understanding and application of knowledge.

4.3.3 Create Immersive Learning Environment

By leveraging technologies such as virtual reality (VR) and augmented reality (AR), an immersive learning environment is created, allowing students to study and practice in virtual scenes, thereby enhancing the interest and experience of learning [30]. Develop intelligent learning assistants with emotional interaction capabilities, which can provide personalized learning support and psychological counseling services based on students' emotional states and learning needs. Computer vision and natural language processing technologies can automatically adjust font size and contrast, and provide voice operation functions, creating a more comfortable learning environment for learners.

4.4 Staff Team Building: Achieving the Transition from “Single Source” to “Diversified Collaboration”

4.4.1 Recruiting Teachers with Industry Experience and Technical Background

Colleges and universities need to broaden the channels for recruiting teachers and actively introduce industry experts who have been deeply involved in the elderly care industry for many years, possess academic research capabilities and first-line practical experience, and are proficient in the application of intelligent technologies. These experts should be invited to teach in the school, bringing real scenarios of intelligent elderly care and typical cases of equipment operation and maintenance into the classroom, thereby enhancing the industry relevance and practical effectiveness of the teaching content [31]. On this basis, colleges and universities should cultivate specialized teachers with a combination of expertise in AI technology and proficiency in elderly care services. They should add courses on elderly care practices and regular first-line practical sessions to the training programs for related majors such as elderly services and nursing. Groeneveld et al. [32] established, through a modified Delphi method, a competency framework for nurses working with AI-driven

lifestyle monitoring in long-term care, comprising ten competency domains and 61 sub-competencies that range from a basic understanding of AI to the integration and evaluation of AI outputs in care practice. Although this framework targets practicing nurses rather than educators, it can serve as a reference (after adaptation) for systematically carrying out digital literacy training for teachers, encouraging teachers to simultaneously improve their dual professional capabilities in digital technology and elderly care, and thereby solving the current problem in which teachers focus more on theoretical teaching while lacking strong practical experience in intelligent operations and human-machine collaborative care.

4.4.2 Motivating Teachers for Training and Further Education, Enhancing Professional Competence

Teachers can promptly understand the latest industry trends and cutting-edge technologies through academic seminars, industry training, and enterprise placement training, and thereby update their professional knowledge structure and enhance their professional competence [33]. Regularly organize teachers to participate in AI technology training, academic seminars, and other activities to update their knowledge structure and improve their ability to use AI technology for teaching. Establish a teacher incentive mechanism and give commendation and rewards to teachers who perform outstandingly in the integrated teaching of AI and elderly care service talent education.

4.4.3 Institutionalization of Teachers' Practice in Enterprises

The institutionalization of teachers' practice in enterprises is implemented. Teachers regularly go to elderly care service enterprises for practical training, to understand the work processes and job requirements of the enterprises, and to enhance their practical teaching abilities [31]. Through this approach, a "dual-qualified" teaching team with both solid theoretical foundations and rich practical experience is cultivated. Encourage universities to collaborate with elderly care service institutions and enterprises, establish internship and training bases, and provide practical opportunities for students and teachers.

4.5 Platform Construction for Practice: Achieving the Transformation from "Intra-campus Isolation" to "Open Integration"

4.5.1 Strengthening the Construction of Intra-campus Training Bases

Strengthen the construction of intra-campus training bases, creating high-standard simulated elderly care homes, rehabilitation training centers, and intelligent elderly care training platforms, to create a realistic working environment and form a "three-in-one" ability training system of full simulation training, job-shadowing internship, and on-post internship, to comprehensively improve students' on-the-job practical abilities [34]. Build smart classrooms suitable for learners' learning, and update high-performance servers, intelligent terminals, large screens, etc.

4.5.2 Expand Off-campus Internship Bases and Deepen School-Enterprise Cooperation

Establish close cooperative relationships with various elderly care institutions and enterprises, and expand off-campus internship bases. Deepen school-enterprise cooperation, jointly revise the talent training plan, jointly guide students' internships, jointly establish a teaching evaluation system and effectively implement it, achieving shared resources, joint talent cultivation, and joint process management. Carry out order-based training and modern apprenticeship pilot programs, and conduct order-based training with enterprises, cultivating specialized talents for them according to the specific requirements of the enterprises [7].

4.5.3 Build Industry Colleges Together, and Achieve Resource Sharing and Collaborative Innovation

Colleges of vocational education and elderly care enterprises jointly build industry colleges, integrating the resources of both sides, including teachers, equipment, technology, etc. [34]. By jointly conducting research projects, developing technologies, and designing curricula, vocational colleges and elderly care enterprises can share resources and promote collaborative innovation, promoting technological progress in the elderly care industry and the improvement of talent cultivation quality. Establish cross-industry and cross-field data sharing and circulation mechanisms, and promote the open application of elderly-related public data.

4.6 Improvement of Guarantee Mechanisms: Achieving the Transition from “Single Point Breakthrough” to “Systematic Promotion”

4.6.1 Strengthening Top-level Design and Policy Guidance

Evidence from international scoping reviews shows that integrating digital technology into practical skills teaching in social and health care professions can enhance students' knowledge, competence, and motivation [35]. This highlights the importance of establishing a supportive policy and management framework for the integration of AI into elderly care education talent training, refining various guarantee measures, and solidifying work responsibilities across relevant government departments. Strengthen macro planning and overall management, coordinate the work of education, civil affairs, and health departments, and strive to cultivate an enabling environment for high-quality, content-rich, and humanistic AI elderly care education talent training [36].

4.6.2 Multiple Parties Raising Funds to Solve Difficulties

The deep integration of AI technology and elderly care education talent training requires sufficient financial support in various aspects such as algorithm research and development, equipment purchase, etc. Developing intelligent systems that can precisely analyze students' learning data and provide personalized learning plans requires a large amount of funds. In addition to increasing government investment and establishing special funds, policies should also be formulated to offer enterprises preferential and subsidy measures to encourage social capital to invest in the elderly care education field.

4.6.3 Establishing a Risk Prevention and Collaborative Governance System

Given the fast iteration and strong industry penetration of AI technology, in response to the potential risks and challenges that may arise from the application of AI in elderly care talent education, it is necessary to accelerate the establishment of a risk prevention framework and process that covers risk assessment, risk management, and risk communication [37]. At the technical level, strengthen data standardization construction to ensure the authenticity, accuracy, and diversity of data, prevent excessive data collection and abuse, improve algorithm transparency and interpretability, and eliminate algorithm bias and discrimination. At the institutional level, establish a sound legal and institutional framework to ensure the healthy development of AI in elderly care talent

education, and improve the accountability system. At the value level, adhere to the human-centered principle of humanism and the ethical stance of technology moving toward goodness, promote professional ethics and moral responsibility, and drive instrumental rationality with value rationality to ensure that AI technology achieves empowerment [16].

4.6.4 Adhering to the Laws of Educational Development and the Laws of the Entire Life Cycle

UNESCO's guidance on AI and education frames lifelong and continuing professional development as a central pillar of AI-enabled education systems [27]. In this light, the education of elderly care professionals—spanning initial vocational training, in-service upgrading, and career-long competency renewal—represents a concrete embodiment of the lifelong learning principle in the vocational domain, one that AI technology is well positioned to support at every stage. “AI + Elderly Care Professional Education”, as a new educational form, conforms to the laws of life-cycle education from the perspective of the time dimension, and complies with the laws of upgrading educational methods from the perspective of educational means. Educators should re-recognize AI from their own perspectives and not simply regard it as a tool, but rather understand it from the higher perspective of new quality productive forces. One should think about the issue from the perspective of learners and adhere to the “people-oriented” concept to integrate AI into education. In addition, the learning and use of AI technology should be included in the curriculum system. The teaching content should appropriately increase basic knowledge of AI, application skills, and practical operations, and be accompanied by corresponding practical activities.

5 Conclusion and Outlook

The empowerment of elderly care service practitioners' education by AI is a systematic and comprehensive project that is tailored to the deep aging society and promotes the high-quality development of the elderly care industry. We have expounded the value of AI in empowering elderly care service practitioners' education, deeply analyzed the current practical challenges, and proposed practical paths from the dimensions of conceptual transformation, curriculum system reconfiguration, teaching mode innovation, teacher team building, practice platform establishment, and guarantee mechanism improvement. The empowerment of elderly care service practitioners' education by AI should follow the principles of

problem orientation, precision and individualization, and adaptability. It should solve homogeneity through individualization, alleviate the shortage of teachers through empowerment, reconstruct the training scenario through embedding, enhance platform efficiency through intelligence, and ultimately solve the traditional training problems of elderly care service practitioners' education with the new model of "AI + elderly care service practitioners' education", providing new impetus for the high-quality development of elderly care service practitioners' education. Future research can expand the application scenarios of generative AI and conduct empirical studies based on specific regional or institutional practical cases to optimize integration paths and promote the implementation and transformation of research results, ensuring that the application of AI in elderly care service practitioners' education is both efficient and safe, and ultimately helping to fully implement the strategy of actively responding to population aging and promoting the high-quality development of elderly care services.

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Conflicts of Interest

The authors declare no conflicts of interest.

AI Use Statement

The authors declare that no generative AI was used in the preparation of this manuscript.

Ethical Approval and Consent to Participate

Not applicable.

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