

Exploring Pathways for Artificial Intelligence-Empowered Teaching Reform in Elderly Care Service Management Curriculum

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Abstract: The accelerating pace of global population aging presents both opportunities and challenges for the teaching reform of Elderly Care Service Management, a core course in the elderly care service management major. As digital transformation reshapes higher education, this course faces pressing pedagogical hurdles. Artificial intelligence (AI), with its strengths in largescale data processing, personalized interaction, and virtual simulation, offers novel pathways for digital teaching innovation. Based on the relevant policy guidance of Healthy China, active aging, and the integration of artificial intelligence education, this paper systematically combs the existing teaching pain points of the course “Elderly Care Service Management” and constructs the complete implementation framework for the teaching reform of an artificial intelligence empowerment course from the four dimensions of reshaping students’ professional identity and reconstructing the interdisciplinary curriculum system. By benchmarking the quantitative indicators of smart curriculum construction, clarifying the layered landing guarantee measures, and reforming the expected results and practical potential risks, thereby establishing a reproducible and scalable paradigm for “AI + Elderly Care Service Management” smart course construction. The findings can provide a reference for the digital teaching and intelligent curriculum development of the elderly service management major in domestic medical colleges and universities, and help the high-quality development of China’s aging cause and the implementation of the healthy China strategy.

Keywords: Elderly Care Service Management; Artificial intelligence; Teaching reform; Virtual simulation

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1. Introduction

The Seventh National Population Census reports 264 million people aged 60+ in China (18.7%), indicating deepening aging. The *New Generation AI Development Plan* and the *14th Five-Year Plan for Aging Affairs* jointly promote artificial intelligence (AI)-teaching integration and smart healthy aging talent cultivation.

Meanwhile, care demand is shifting from daily assistance to health management and social participation, raising competency requirements ^[1], yet current training systems show notable deficiencies ^[2]. The Ministry of Education's 2023 Report confirms widespread mismatches between training and industry needs.

Since 2020, 48 institutions have launched this major (May 2026), with medical/pharmaceutical universities comprising about half. Programs are dispersed across TCM, management, and nursing, yet most face structural difficulties—vague objectives, fragmented curricula, weak practical training, and insufficient faculty—limiting talent output.

A structural gap persists between graduate competencies and industry requirements. Advancing program construction is essential for Healthy China and aging response strategies. This study constructs an “AI + Elderly Care Service Management” paradigm, examining identity reshaping, curriculum restructuring, and faculty development. It analyzes teaching challenges and reform pathways, aiming to inform digital teaching and smart course development, ultimately supporting high-quality aging services.

2. Challenges confronting the teaching of aging services management

2.1. Low professional identity and social cognitive biases

Students' professional identity remains persistently low due to societal misconceptions. Deep-seated prejudices equate the field with frontline custodial work, overlooking its managerial dimensions—including operations, medical-nursing integration, marketing, and quality management ^[3,4]. This directly undermines career aspirations. Many students are admitted through reassignment, carrying cognitive biases upon enrollment. Identity declines with grade progression as coursework intensifies and career prospects remain uncertain ^[5,6].

2.2. Imbalanced curriculum and disconnection from practice

The course integrates medicine, nursing, and management, yet overemphasizes theory while neglecting practical competencies such as risk control and infection prevention ^[7,8]. The curriculum lags behind industry digitalization, with outdated materials focused on traditional care models. Multidisciplinary knowledge remains fragmented across isolated chapters, hindering integrated decision-making. Theoretical instruction dominates, while scenario simulations and internships are limited—restricting students to basic nursing and preventing exposure to core digital management functions. Value education remains superficial, failing to embed active aging or humanistic care themes into core content.

2.3. Faculty development requires enhancement

Faculty face triple competency demands—theory, practice, and digital technology. Core teachers predominantly hold public health or management backgrounds, lacking clinical or informatics training, limiting instruction on AI-based geriatric assessment and smart platforms. “Dual-qualified” teachers are scarce; full-time faculty lack industry exposure, while adjunct practitioners lack pedagogical training ^[9]. Teachers' AI literacy is weak, with most unable to proficiently use large models, virtual simulation, or data analytics tools, creating a gap between teaching capabilities and industry needs ^[10].

2.4. Fragmented resources and lagging smart platforms

Resource scarcity is a major bottleneck, with inventories suffering from slow iteration and insufficient

intelligence—falling short of smart curriculum needs. Case bases and video resources are outdated, lacking frontier industry content ^[11]. Adaptive learning tools are absent; platforms support only basic functions without personalized recommendations or intelligent tutoring. Virtual simulation systems for institutional operations—including risk control and emergency response—are unavailable, impairing decision-making training. Practice-based quality is uneven, and school-enterprise cooperation remains superficial, preventing theory-to-practice translation.

3. Exploring pathways for AIempowered teaching reform in elderly care service management

3.1. Artificial intelligence empowers professional identity remodeling

To address the issue of low professional identity among students, an AIbased career cognitive intervention system can be constructed. Through virtual reality (VR) and augmented reality (AR) technologies, an immersive experience environment of elderly care institution management scenarios can be created, enabling students to intuitively understand the diversified connotations of modern elderly care service management. Research indicates that intelligent career profiling can effectively demonstrate the work contents of elderly care service management positions in core areas such as institutional operations, quality management, and informatization construction, and help eliminate social cognitive biases ^[12]. At the same time, machine learning algorithms can be used to construct a dynamic evaluation model of students' professional identity. By analyzing students' learning behavior data and cognitive development patterns, customized career development path planning can be provided for students at different grade levels. In response to the career development uncertainties faced by senior students, the intelligent system, based on industry talent demand data, can provide precise career competency assessments and developmentrelated recommendations, which may alleviate the decline in professional identity in the elderly care service management major as grade level increases.

3.2. AI-driven restructuring of the curriculum system

Using natural language processing and big data analysis technologies, establish an intelligent course optimization mechanism, construct an interdisciplinary knowledge graph, and achieve systematic integration of multidisciplinary knowledge including management, medicine, and nursing. By analyzing the development trends of the elderly care industry and job competency requirements, the artificial intelligence system can dynamically adjust course content to ensure effective alignment between theoretical teaching and practical needs. Research shows that AIbased course optimization systems can timely identify outdated content in traditional textbooks and incorporate the latest practices in emerging sectors such as smart elderly care ^[13]. Second, develop an AIbased virtual simulation teaching platform for elderly care service management to simulate the real environment of elderly care institution operations and management. In virtual scenarios, students can conduct management decisionmaking training in risk assessment, resource allocation, crisis management, and other different scenarios of elderly care institutions, effectively compensating for the deficiencies of traditional practical training courses. Through intelligent case simulation and decisionmaking exercises, enhance students' practical application abilities. Finally, use generative artificial intelligence technology to deeply mine ideological and political elements in professional courses and build an intelligent case generation system for ideological and political education. By analyzing the intrinsic logical connections

between course content and ideological and political elements, assist teachers in designing teaching plans that both meet professional requirements and contain value guidance, promoting the organic integration of knowledge transmission and value cultivation.

The course construction of “elderly care service management” driven by artificial intelligence should be closely linked to the strategic goal of “Healthy China 2030.” Based on the construction and development needs of the professional group of elderly care service and management disciplines in colleges and universities, it should conform to the trend of artificial intelligence-enabled education and teaching reform in the new era, benchmark the development requirements of the *Education Power Construction Plan (2024–2035)*, take the strategy of serving healthy China as the core orientation, adhere to the concept of the construction of the future number intelligence-enabled health care industry, and focus on the whole process of “pre-class–in-class–after-class–evaluation–management.” The intelligent teaching system of the artificial intelligence-enabled pension service management course can be constructed.

3.3. Artificial intelligence promotes the construction of teaching staff

In terms of artificial intelligence boosting the construction of teaching staff, breakthroughs can be achieved by constructing a human-machine collaborative teaching model and establishing an intelligent evaluation system for teachers’ abilities. Specifically, the development of an artificial intelligence teaching assistant system provides professional knowledge support for teachers with an interdisciplinary background and provides real-time question answering and case supplements in professional teaching fields such as health assessment and health education, so as to effectively expand the depth and breadth of teaching content and improve the overall teaching quality. At the same time, based on big data analysis, a teacher ability evaluation model is constructed to customize personalized ability improvement programs for college teachers; by constructing a virtual teaching and research platform, we can promote in-depth communication between university teachers and industry experts, and promote the construction of “double-qualified” teachers. In addition, by constructing an artificial intelligence-driven teacher continuing education training system, according to the individual differences of teachers, a personalized path for improving teachers’ teaching literacy is provided ^[14].

3.4. Pathways for AI-empowered teaching resource innovation

The innovation of AI-enabled teaching resources can be pursued along three interrelated pathways.

First, generative AI technologies can be employed to construct an automatic case generation system. By analyzing operational data and regulatory frameworks from domestic elderly care institutions, this system produces real-time teaching cases that reflect the latest industry developments. This establishes a dynamic resource update mechanism that mitigates the obsolescence of instructional materials and ensures curriculum relevance.

Second, an adaptive learning system—grounded in students’ behavioral data and proficiency levels—can be developed to offer personalized learning pathways for Aging Services Management majors. By intelligently diagnosing knowledge gaps, the system delivers targeted resources and training modules, accommodating diverse learner needs and enhancing instructional effectiveness.

Third, AI-enhanced virtual training platforms can be upgraded to incorporate natural interaction and intelligent decision-support functions, simulating a broad spectrum of managerial scenarios in

institutional operations. Such platforms not only transcend physical space constraints but also provide data-driven performance evaluations that inform teaching reform. Collectively, these three pathways drive the modernized transformation of teaching resources in the field.

4. Conclusion and future perspectives

The curricular development of Aging Services Management in China remains in its nascent stage. It is constrained by multiple factors, including industry perceptions, disciplinary evolution, faculty availability, and instructional infrastructure.

Current teaching practices exhibit four major structural deficiencies. First, persistent societal stereotypes about the profession lead to low student identity and weakened enrollment appeal. Second, the curriculum lacks interdisciplinary integration, featuring outdated textbooks, a predominance of theoretical instruction, and a scarcity of digital practical scenarios. This results in a graduate competency mismatch with actual industry demands. Third, the teaching workforce exhibits limited interdisciplinary and digital teaching competencies, hampering the delivery of cutting-edge AI-integrated content. Fourth, the intelligent resource system remains underdeveloped, including case databases, adaptive tools, and simulation platforms, while school-enterprise collaboration remains superficial. To address these pain points, this study proposes a comprehensive AI-empowered reform framework for the “AI + Aging Services Management” curriculum. The framework includes four strategic components. First, it leverages VR/AR immersive scenarios and machine learning-based dynamic assessment to reshape students’ professional identity. Second, it applies natural language processing and big data analytics to construct an interdisciplinary knowledge graph, while integrating generative AI with virtual simulation to restructure the curriculum and upgrade practicum settings. Third, it establishes tiered faculty development channels through human-AI collaborative assistants and intelligent competency evaluation systems. Fourth, it utilizes generative AI case databases, adaptive learning systems, and smart virtual training tools to achieve a full-chain intelligent upgrade of teaching resources. Together, these components form a closed-loop smart teaching ecosystem encompassing pre-class, in-class, post-class, assessment, and management processes. Looking ahead to the medium- and long-term imperatives of active aging, Healthy China, and the building of a strong education nation, the digital teaching reform of Aging Services Management still has considerable room for advancement.

Future efforts should focus on three major directions. First, deepening the immersive integration of large language models and extended reality (XR) with professional scenarios to create comprehensive simulation environments covering institutional operations, integrated medical-nursing-healthy aging services, and long-term care insurance digital management. Second, building a full-cycle learner profiling system based on educational big data to establish a tiered, personalized, and interdisciplinary talent cultivation mechanism. Third, breaking down data silos among universities, smart elderly care enterprises, and civil affairs institutions to construct an intelligent collaborative education platform featuring industry-education integration and data interoperability.

Concurrently, it is essential to establish ethical guidelines and risk prevention mechanisms for AI applications in teaching, adhering to the fundamental principle of fostering virtue through education. Balancing technological empowerment with the humanistic core of elderly care pedagogy will be critical.

Ultimately, this approach aims to build a sustainable, technology-enabled, human-centered, and

collaboratively governed smart teaching ecology. It will continuously cultivate compound talents who combine management acumen, medical foundations, digital capabilities, and gerontological empathy, thereby providing robust talent support for the high-quality development of China's aging services sector and the effective implementation of the active aging strategy.

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Author contributions

SH: Methodology, Software, Validation, Visualization, Writing — review & editing. LW: Conceptualization, Data curation, Formal analysis, Methodology, Software, Validation, Writing — original draft. YM: Conceptualization, Data curation, Formal analysis, Methodology, Software, Validation, Writing — original draft. ZG: Conceptualization, Data curation, Formal analysis, Methodology, Software, Validation, Writing — original draft. QZ: Data curation, Project administration, Supervision.

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