Pathways to Advancing the Discipline of Social Security in the Age of Artificial Intelligence

Yumin Chen*

Liaoning University of International Business and Economics, Dalian 116000, Liaoning, China

*Author to whom correspondence should be addressed.

Abstract: The advent of the Artificial Intelligence (AI) era is reshaping the theoretical paradigms and implementation models of social security, necessitating the advancement of its academic discipline. The discipline confronts outdated curricula, a lack of interdisciplinary faculty expertise, and a significant gap between theoretical research and technological application. Addressing these challenges requires systemic reform focused on three objectives: cultivating interdisciplinary professionals with both theoretical foundations and advanced data literacy; integrating computational social science with traditional social security theories; and championing the synergy between technological ethics and social governance to ensure technology serves the common good ("technology for good"). Key strategies include modernizing course content and pedagogy, innovating collaborative education models that bridge academia and industry, and building interdisciplinary faculty teams. This transformation is not a mere technological adaptation but a fundamental imperative for the discipline to achieve principled innovation while upholding its core values of equity and justice.

Keywords: Artificial Intelligence; Social Security Studies; Disciplinary Advancement; New Liberal Arts Education

1. Introduction

The technological revolution spearheaded by Artificial Intelligence (AI) is reshaping socioeconomic landscapes and models of national governance. As a cornerstone of public welfare, social security confronts both disruptive opportunities and challenges. This transformation is propelled by two converging forces. On one hand, AI is driving an intelligent evolution in social security practices. Applications such as algorithmic decision-making and precision profiling[1] in elderly care, medical insurance, and fund supervision have fundamentally altered the delivery and efficiency of public services, injecting new momentum into the discipline's development. On the other hand, China's "New Liberal Arts" [2] initiative provides strategic guidance, creating an opportunity for the social security discipline to integrate knowledge from computer and data sciences and transition toward a computational social science paradigm. Consequently, cultivating interdisciplinary professionals with data literacy and technological ethics to serve national strategies like "Digital China" has become a pressing mandate.

Despite this promising context, the advancement of the social security discipline faces pressing challenges. Existing curricula and knowledge frameworks lag behind technology-enabled practice. A "digital divide" among faculty creates

a contradiction between traditional teaching and the goal of nurturing interdisciplinary talent. Furthermore, a disconnect persists between theoretical research and the practical application of intelligent technologies, diminishing the discipline's intellectual leadership. Therefore, an investigation into pathways for advancing the social security discipline in the age of AI is imperative. Such an inquiry is not just an internal necessity for the discipline's modernization but also an essential contribution to modernizing national governance, holding both theoretical and practical value.

2. Driving Forces and New Imperatives for the Development of Social Security Studies in the AI Era

2.1. The Transformative Impact of AI on Social Security Practices

The advent of the AI era is reshaping the practical landscape of social security, offering new technological possibilities to improve the quality of life. This technology-driven transformation is the primary impetus for the discipline's advancement. Traditional, reactive management models are being supplanted by proactive, precise, and personalized service paradigms. For instance, "AI-powered elderly services" offer intelligent solutions for deep aging, while in medical insurance, AI and big data are critical for preventing fund fraud and enhancing efficiency. In social assistance, algorithmic analysis enables more accurate identification of vulnerable groups and facilitates a shift from reactive to proactive aid delivery, improving targeting and effectiveness. This transformative wave accelerates the development of a unified national public service platform and presents new requirements for constructing a multi-tiered, sustainable social security system. This evolution in practice compels the social security discipline to confront technological empowerment by systematically reconstructing its theoretical frameworks, knowledge systems, and research paradigms.

2.2. The "New Liberal Arts" Initiative as a Catalyst for Interdisciplinary Integration

The "New Liberal Arts" initiative is a key driver for the interdisciplinary advancement of social security studies. While the discipline has always integrated knowledge from economics, sociology, and law, traditional academic silos have constrained its development. In 2020, the Ministry of Education's "Declaration on the Development of New Liberal Arts" provided clear direction, aiming to break down disciplinary barriers and reconstruct knowledge systems. In the AI era, this mandate has deepened to require integration between the social sciences and STEM disciplines. For social security studies, this necessitates incorporating technologies like AI and big data, driving a paradigm shift toward computational social science. This integration is instrumental in overcoming current dilemmas, such as theoretical research lagging behind practice, by fostering systematic analyses to address complex social risks and build more efficient social security systems.

2.3. New Demands for Social Security Professionals Driven by National Strategies

The Report to the 20th National Congress of the Communist Party of China identified the "advancement of education digitalization" as a critical task in building a leading nation in education[3]. This emphasis was reiterated on March 6, 2025, when General Secretary Xi stressed the need to "implement the national strategy for digital education, build a learning society, and foster an environment where talent of all types and levels can emerge[4]." The deepening implementation of this digital education strategy has imposed new and higher standards on the knowledge structures and professional competencies of social security graduates, acting as a fundamental external driver for the discipline's development. In this new era, the comprehensive promotion of national rejuvenation and a strong nation through Chinese-style modernization places new historical demands on building a leading educational powerhouse. As General Secretary Xi has emphasized, such a nation must possess formidable "capabilities in ensuring public well-being." This strategic positioning requires that the talent development objectives of the social security discipline be highly aligned with national development strategies.

Whether the goal is to solidly advance common prosperity, proactively address population aging, or serve the "Digital China" initiative, there is an urgent need to cultivate a large cohort of interdisciplinary and innovative professionals who are not only proficient in social security theory and policy but also possess advanced data literacy and digital skills. Traditional

policy implementers and researchers are increasingly ill-equipped to handle the growing complexity and technical challenges of social security governance in the age of AI. The new generation of social security professionals must be capable of leveraging big data and AI for policy simulation, risk forecasting, and service optimization. Simultaneously, they must possess a capacity for critical reflection on technological ethics to navigate emerging governance challenges such as algorithmic bias and data privacy. Therefore, serving the new demands of national strategies by cultivating high-caliber professionals for a more equitable, efficient, and sustainable public welfare system has become the core task and historical mission of the social security discipline in the age of AI[5].

3. Current Dilemmas and Challenges for the Social Security Discipline in the Age of AI

3.1. Lagging Curricula and Knowledge Frameworks

Despite the unprecedented pace at which AI is reshaping the landscape of social security practice, the discipline's curricula and knowledge provision exhibit a significant lag and inertia, representing a primary dilemma in adapting to the intelligent era[6]. Currently, the social security programs in most universities adhere to a traditional paradigm. Their core content predominantly revolves around institutional history, policy frameworks, and classical theoretical schools, while the systematic integration of emerging fields such as data science, computational social science, and algorithmic ethics remains severely inadequate. This lag is evident not only in the absence of entire course modules but also in the outdated nature of teaching content. While innovations in social security practice are occurring rapidly, the theoretical knowledge that serves as its primary vehicle is updated at a pace far slower than technological iteration, leading to a disconnect between what students learn and the realities of the field. This "outmoded talent development model" renders the curriculum incapable of effectively responding to the new demands of AI-driven social security governance—namely, capabilities in data analysis, algorithmic comprehension, and ethical reasoning. Consequently, a structural schism has emerged between knowledge supply and societal demand, severely impeding the cultivation of social security professionals equipped with the core competencies required for the new era[7].

3.2. Faculty Deficiencies in Knowledge Structure and Pedagogical Methods

The core bottleneck in the discipline's development lies in the adaptability of its faculty, who exhibit a significant misalignment with the demands of the AI era in both knowledge structure and pedagogical methods. Most faculty members, trained in traditional social sciences, lack a systematic command of STEM subjects such as data science and machine learning. This shortage often confines classroom discussions on AI to a macro-level analysis of its impacts, rarely delving into technical principles and creating a "knowledge gap" between theoretical discourse and technology enablement.

In pedagogy, traditional teacher-centered, lecture-based models remain dominant, exacerbating the disconnect between theory and practice. Faculty generally lack the proficiency to use computational tools for data-driven policy analysis or project-based research, thus struggling to cultivate the essential skills for the intelligent era. This maladaptation is compounded by a competitive academic environment where heavy teaching loads and research pressure prevent faculty from investing sufficient energy in interdisciplinary learning and pedagogical innovation. These intertwined deficiencies create a critical constraint on the discipline's development, hindering the cultivation of interdisciplinary talent needed to meet new national strategic needs.

3.3. The Disconnect Between Theoretical Research and Technology-Enabled Practices

A significant disconnect between theoretical research and technology-enabled practices constitutes another profound challenge for the social security discipline in the intelligent era[8]. At present, a substantial body of academic research remains focused on macro-level discussions and philosophical reflections regarding the impact of AI. However, there is a lack of in-depth empirical analysis concerning the specific mechanisms of algorithmic governance, the underlying logic

of data model construction, and the actual effectiveness of technological applications within the social security domain. Technology is often treated as a "black box," and the complex interplay between its internal operational logic and its societal effects has yet to be fully elucidated.

Simultaneously, social security agencies and practitioners are rapidly transitioning toward a model of "speaking, deciding, managing, and innovating with data," where the pace of technological iteration far outstrips that of theoretical reflection. This lag exacerbates the pre-existing dilemma where "theoretical research trails behind the development of institutional practice." Consequently, policy recommendations from academia often prove difficult to translate into effective applications, as they tend to overlook technical feasibility and practical complexities. This schism between theory and practice not only weakens the discipline's explanatory power over real-world problems and its capacity to guide future development but also constrains original breakthroughs in the theoretical framework of social security with Chinese characteristics. It ultimately hinders the discipline's ability to respond effectively to the profound governance transformations triggered by the intelligent era.

4. Redefining the Objectives for the Advancement of Social Security Studies in the AI Era

4.1. Talent Development Objective: Cultivating Interdisciplinary Professionals with Data Literacy

As AI technology integrates with social security practice, traditional talent development models are inadequate. The primary objective for the discipline must be to cultivate innovative, interdisciplinary talent with a solid foundation in social security theory and strong data literacy. This objective aligns with the "New Liberal Arts" initiative, which promotes integration between the humanities and STEM fields.

Specifically, these professionals must master not only traditional social security theories but also the methods of data science, AI, and computational social science. This requires a transformation from a single-discipline framework to an interdisciplinary "Social Security + Data Science" model. Data literacy is their core competency, encompassing not just technical skills in data analysis but also a capacity for critical data thinking. This enables them to discern patterns in large datasets and mitigate algorithmic bias and ethical risks. Talent development must confront the challenge of "digital exclusion," where some students lack the ability to use data for problem-solving. By systematically reconstructing the curriculum, data literacy must be integrated throughout the talent development process, ensuring graduates can apply intelligent technologies for policy simulation, risk forecasting, and precision services, thereby providing human capital for an intelligent social security system.

4.2. Knowledge Framework Objective: Integrating Computational Social Science with Traditional Theory

The core objective in constructing the knowledge framework for the social security discipline in the AI era is to bridge the chasm between traditional theoretical paradigms and computational social science, achieving their deep integration and synergistic development. A key challenge currently facing the discipline is the disconnect between theoretical research and data-driven practice. Adherence to purely normative research risks rendering theory abstract and detached from the support of vast datasets. Conversely, an excessive focus on technology and models could lead to a technocratic bias, lacking theoretical depth and value orientation, thereby failing to address the discipline's fundamental commitment to equity and justice[8].

Therefore, the reconstruction of the knowledge framework for the new era aims to catalyze an endogenous paradigm shift. This shift involves, first, leveraging classical social security theories to formulate forward-looking research hypotheses and ethical frameworks that can serve as a value compass for algorithm design and data application. Second, it entails applying computational methods such as big data analytics and machine learning to test, refine, and extend these hypotheses, uncovering new patterns and causal relationships from complex social interactions. China's vigorous promotion of the "Golden Social Security Project" and its strategic commitment to building a "unified national social

insurance public service platform" provide an unprecedented data foundation and application context for this integration. This demands a knowledge framework capable not only of explaining why we need social security but also of precisely answering how to implement it. Through theory-guided data mining, this framework should translate macro-level institutional principles into micro-level, operational, and dynamically optimized policy solutions. The ultimate goal is to forge a social security knowledge system with Chinese characteristics that is both deeply rooted in humanistic values and firmly grounded in robust data, thereby providing the intellectual foundation for building a more equitable, efficient, and sustainable public welfare system[9].

4.3. Disciplinary Mission: Championing Synergy Between Technological Ethics and Social Governance

As AI transforms the vision of precise and efficient social security governance into reality, its inherent ethical risks—such as algorithmic discrimination, data bias, and a "new digital divide"—simultaneously emerge, posing a potential threat to social equity. Consequently, the fundamental mission of the social security discipline in the age of AI must transcend purely instrumental-rational discourse and elevate itself to championing a deep synergy between technological ethics and social governance. The discipline's role is no longer simply to evaluate or apply technology; it must become a "welder" of technological rationality and value rationality, ensuring that the ultimate purpose of technological empowerment is human dignity and social justice, not the cold pursuit of efficiency.

This mission demands that research in the discipline be guided by a "people-centered" philosophy. It requires proactive engagement in the entire lifecycle of technological application, embedding principles of fairness, inclusivity, and transparency into the very design of algorithms and models from the outset. This approach is crucial to prevent the alienation where technology undermines equity and to promote the construction of a responsible and trustworthy intelligent governance system. Ultimately, the value orientation of the discipline lies in defining the ethical guardrails and behavioral boundaries for social security in the intelligent era. Its purpose is to ensure that technological progress always serves the fundamental goal of enhancing the well-being of all people, thereby forging a new paradigm of social governance characterized by "technology for good" and equitable access for all.

5. Core Pathways to Empowering the Advancement of the Social Security Discipline

5.1. Modernizing Course Content and Innovating Pedagogical Methods

A core pathway to empowering the advancement of the social security discipline lies in the systematic reconstruction and innovative transformation of its traditional curriculum and teaching models. In terms of course content, it is essential to move beyond the existing knowledge framework, which is primarily focused on institutional exegesis and theoretical speculation. The curriculum must systematically incorporate core modules such as the fundamentals of data science, machine learning, computational social science methodologies, and technological ethics. This will drive a paradigm shift in knowledge from a qualitative-dominant approach to one that balances qualitative and quantitative methods, integrating theory with computation. The goal is to construct an interdisciplinary knowledge map that supports the cultivation of versatile, future-ready professionals.

Regarding pedagogical methods, there must be a shift away from the unidirectional, lecture-based model toward an inquiry-based learning approach that is both problem-oriented and project-driven. For instance, a project-based learning case could be designed around China's nationally implemented intelligent monitoring system for healthcare services. In this scenario, students would be guided to use real or simulated data to train a fraud detection model, allowing them to gain a deep, hands-on understanding of algorithmic logic, policy intent, and ethical considerations. This practice-oriented learning model effectively facilitates the transition of students from passive recipients of knowledge to active constructors of it. By honing their skills in data analysis, model application, and critical thinking within authentic contexts, this approach helps to bridge the gap between theoretical study and the practice of national governance, ensuring that talent development is precisely aligned with the societal demands of the intelligent era[10].

5.2. Innovating Collaborative Education Mechanisms Through Industry-Academia Integration

In the face of social governance transformations driven by intelligent technology, the traditional closed-loop cultivation model of universities struggles to effectively bridge the gap between theoretical instruction and practical application, often resulting in graduates who lack sufficient adaptive capabilities in real-world settings[6]. Therefore, establishing a deeply integrated mechanism for collaborative education between industry and academia is pivotal for the high-quality development of the discipline. The core of this lies in creating a substantive, multi-level collaborative system involving universities, government agencies, and enterprises.

This requires universities to transcend traditional campus boundaries and forge dynamic, close-knit strategic partnerships with social security agencies at all levels, leading technology companies, and other relevant organizations. For example, joint initiatives could include establishing "Smart Social Security Labs" or "Big Data Centers for Social Governance," which would provide students with invaluable platforms to engage with real-world data and participate in live projects. Building on this foundation, a dual-mentor system that pairs academic supervisors with industry experts should be comprehensively implemented. This system would guide students as they undertake research on critical national strategic topics—such as actuarial forecasting for pension funds, intelligent cost control in medical insurance, or early-warning systems for employment risks—while simultaneously receiving training in both academic standards and cutting-edge technologies. This practice-oriented, collaborative education model can effectively address the disconnect between talent development and industry needs. It ensures that the discipline's evolution is closely aligned with the demands of national governance, thereby supplying the social security sector with practice-ready professionals capable of solving complex, real-world problems.

5.3. Strengthening Interdisciplinary Faculty Teams and Research Capabilities

Faculty knowledge structures are a key constraint in adapting to the AI era, often marked by outdated frameworks and methodological homogeneity. To address this, a dual strategy of external recruitment and internal development, guided by the "New Liberal Arts" initiative, is imperative. The goal is to build an interdisciplinary faculty team possessing deep foundations in social security theory and cutting-edge data science capabilities.

This requires breaking traditional personnel barriers by recruiting experts from fields like computer science, data science, and AI ethics to form complementary teams. Simultaneously, a regularized faculty development mechanism must support existing instructors in systematically learning advanced technologies to analyze complex social problems. Building on this stronger faculty base, a concerted effort should be made to promote organized research. This involves forming interdisciplinary collaborative teams focused on the strategic needs of China's social security system, shifting from an individual research model to one of synergistic innovation. Such teams should conduct cutting-edge research in areas like policy simulation and precision risk forecasting, driving a holistic upgrade of the research paradigm and injecting sustainable momentum into the discipline's development.

6. Conclusion

The advent of the Artificial Intelligence era is not only a technological engine for social security but a catalyst for the systematic transformation of its academic discipline. This is a profound paradigm revolution, centered on three objectives: cultivating interdisciplinary professionals equipped with data literacy, integrating computational social science with traditional theory, and fostering synergy between technological ethics and social governance.

Achieving these objectives requires dismantling barriers between theoretical research and social practice. This involves the systematic innovation of course content and pedagogy, the creation of collaborative education mechanisms that integrate industry and academia, and the strengthening of interdisciplinary faculty teams. By pursuing this path of integrative development, the social security discipline in China is poised to achieve a profound self-renewal. In doing so, it will construct a theoretical and methodological framework that is both distinctly Chinese and globally influential,

contributing scholarly wisdom and practical strength to the modernization of national governance and the realization of a higher level of well-being for all citizens.

Funding

Disclosure statement

The author declares no conflict of interest.

References

[1]   Huang G, 2024, A study on the coupling and coordination of China's medical security, public health, and medical services: Precision profiling and development pathways. Chinese Social Security Review, 8(3): 13-25.

[2]   Ministry of Education of the People's Republic of China, 2020, The 'New Liberal Arts' construction work conference was held at Shandong University. http://www.moe.gov.cn/jyb_xwfb/gzdt_gzdt/s5987/202011/t20201103_498067.html. 2025.7.5.

[3]   Xi J. 2022, Hold high the great banner of socialism with Chinese characteristics and strive in unity to build a modern socialist country in all respects—Report to the 20th National Congress of the Communist Party of China. The State Council of the People's Republic of China. Retrieved https://www.gov.cn/xinwen/2022-10/25/content_5721685.htm. 2025.7.5.

[4]   Xin H, 2024, The distinctive characteristics of a leading educational powerhouse with Chinese characteristics.https://www.xinhuanet.com/politics/20241220/92c422e5b26240eb9abca4c0f7766fce/c.html. 2025.7.5.

[5]   Deng D., Fan Q., 2019, The transformation and upgrading of social security development and research driven by big data, China Social Security, (8): 28-29.

[6]   Han J., Meng Y., 2024, The mission, orientation, and action pathways for the high-quality development of the social security discipline in the new era, Social Security Studies, (6): 91-97.

[7]   Xiong X., Xu L., Wang S., 2021, An inquiry into the teaching reform and innovation of 'Social Security Studies' in the context of big data, Contemporary Educational Theory and Practice, 13(5): 72-78. https://doi.org/10.13582/j.cnki.1674-5884.2021.05.013

[8]   Zhao J., Fan J., 2025, The goal orientation, practical paradoxes, and optimization pathways of the digital transformation of higher education governance. Journal of Suzhou University (Educational Science Edition), 13(2), 65-73. https://doi.org/10.19563/j.cnki.sdjk.

[9]   Tong X., 2024, Three shifts in the development of the social security discipline. Chinese Social Security Review, 8(2): 3-11.

[10]   Zheng Y., Wang Y., 2025, How generative artificial intelligence can empower the high-quality development of science education. Science and Society, 15(1): 11-14. https://doi.org/10.19524/j.cnki.10-1009/g3.2025.01.011