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New Quality Productive Forces Empowering the High-Quality Development of University Volunteer Services: Value Implications and Implementation Pathways

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New quality productive forces necessitate the digital empowerment of volunteer services in the new era to better propel socio-economic development. This paper focuses on youth volunteer work within higher education institutions, systematically examining the shared underpinnings and enabling logic between the theory of new quality productive forces and university youth volunteer services, clarifying an innovation-driven, supply-demand-aligned, and coordinated sustainable empowerment pathway. By analysing existing digital practices in domestic and international universities, it identifies current challenges in top-level design, content provision, and management standards. The paper proposes three implementation pathways for empowerment—foundational, matching, and supply layers—coupled with evaluation feedback, offering recommendations for the intelligent, institutionalised, and standardised development of university volunteer services.

Keywords: new quality productive forces, university volunteer services, high-quality development

Introduction

Data from the 2023 China Volunteer Service Development Index Report indicate that active volunteers contributed an economic value of 179.139 billion yuan to volunteer services. Their contribution to gross domestic product (GDP) increased 2.17-fold from 0.0378% in 2013 to 0.1421% in 2023. This equates to providing society with the equivalent of 1.7355 million full-time employees without remuneration, representing a 2.98-fold increase from 436,000 in 2013. Among active volunteers, 46.18% are university students. By July 2025, China's higher education institution volunteers exceeded 135 million, accounting for nearly half of the national total (Zhai, Liu, & Zhu, 2024). Volunteer services have transitioned from "quantitative expansion" to "qualitative enhancement", becoming an integral component of national socio-economic development and modern governance frameworks. The dual imperatives of digitally-empowered innovation and serving socio-economic development have charted the course for high-quality development in university volunteer services, providing fundamental guidance for enhancing their quality and effectiveness.

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Volunteer services in higher education institutions face significant opportunities and challenges in the new era. On the one hand, China confronts the stark realities of demographic transition, including declining birth rates, an ageing society, diminishing demographic dividends, and labour shortages. It is projected that by 2030, the proportion of China's working-age population will fall below 60%. University students, being within the working age bracket yet not yet entering the labour market, represent a vast youth cohort whose demographic dividend holds potential to become a new engine for sustainable economic and social development (Liu, Hao, & Chen, 2025). On the other hand, the rapid advancement of artificial intelligence (AI) and digitalisation in recent years has seen an increase in volunteer service practices that leverage technological rationality to deliver value-driven, emotionally resonant experiences. Under the requirements of new-quality productive forces, the digitalisation of volunteering offers university youth broader opportunities to apply their professional knowledge, accumulate service experience, and contribute their talents to society. How to promote the high-quality development of university volunteer services has thus become an urgent and important issue requiring resolution.

This thesis will focus on the role of new-quality productive forces in empowering the high-quality development of youth volunteer services within higher education institutions. It will systematically analyse the underlying logic and practical principles, examining cutting-edge domestic and international literature alongside practical case studies. Ultimately, it proposes a replicable "new-quality productivity-driven model for high-quality development of university volunteer services", providing theoretical underpinnings and methodological tools for policy formulation, university practice, and interdisciplinary research.

Realistic Depictions and Practical Scenarios

At the Macro Level, Timely Policy and Legislative Frameworks Are in Place, But There Is a Lack of Focused Guidance on Leveraging Digital Technology to Empower Volunteer Services

From a governmental policy perspective, the Ministry of Education's 2018 Artificial Intelligence Innovation Plan for Higher Education Institutions explicitly outlined a 10-year, three-phase development strategy for technological innovation, talent cultivation, and application demonstration in the field of next-generation artificial intelligence. Regarding talent development, it emphasised the implementation of popular science education, advocated for universities to open their resources, participate in societal science outreach, and enhance their capabilities in intelligent education. Since 2024, multiple provinces have successively introduced three-year action plans for AI-empowered high-quality educational development. These plans collectively propose strengthening infrastructure and computing power support, advancing the intelligent development of professional talent systems, cultivating intelligent teaching staff, and encouraging personalised application models focused on specific domains such as ideological and political education.

Legislative and regulatory developments in recent years have seen the state progressively enacting legislative mandates to enhance AI-empowered education quality across data protection and privacy, national strategy and action legislation, AI ethics, digital copyright, digital oversight, and AI user competency enhancement. Concurrently, the 2025 White Paper on China's Smart Education mentions establishing standards for digital-empowered educational informatisation literacy and teacher competency. Drawing on international experience, UNESCO released the inaugural Global Guidelines on the Use of Generative Artificial Intelligence in Education and Research in 2023, followed by an AI Competency Framework for Students and Teachers in 2024. The European Union jointly published the AI Literacy Framework for Primary and Secondary Education with the Organisation for Economic Co-operation and Development (OECD) in 2025. The United States

successively issued Advancing AI Education for America's Youth and Winning the AI Race: An American Plan for AI Action in 2025.

Regarding higher education institutions, some universities have introduced regulations concerning digital empowerment of volunteer services in terms of volunteer competency and intelligent design. For instance, Tsinghua University's Science Museum Volunteer Charter requires assessment of volunteers' digital exhibition presentation skills and working hours, while Xi'an Jiaotong University's "Xiaojiao Intelligence" Application Platform Management Measures stipulates a closed-loop process for demand research, prototype design, and community validation within the intelligent service module design.

While the Digital Empowerment of Volunteering Has Seen Diverse and Rich Practices, the Coordination of Supply and Demand Still Requires Strengthening

From the perspective of innovative technology application under the new productive forces paradigm, these empowerment practices fall into two primary categories:

Firstly, initiatives focused on disseminating knowledge about the technologies themselves, primarily manifested through popularising emerging intelligent technologies, opening university resource platforms, and interactive demonstrations of counterexamples to technological misuse. For instance, Sichuan University's AI-assisted elderly care project guided community seniors in using AI to generate and restore vintage photographs. Tsinghua University's "Massive AI-empowered Courses" (MAIC) platform, launched on the National Smart Education Public Service Platform, provided access to university-level specialised courses. Meanwhile, Tsinghua's "Hai-Qing" community volunteer initiative employed innovative methods like scenario simulations and AI face-swapping to raise awareness about fraud prevention.

The second category involves establishing digital media reflecting in the following four aspects.

Information connectivity: AI technologies bridge disparate information streams and demographics. For instance, the University of Amsterdam's "Confessional Rescue Team" employs intelligent semantic recognition to link individuals expressing emotional distress on Weibo with support services.

Content generation: Generative AI outputs predictive, advisory, and alert-based information. For instance, Florida International University's AI model trained on architectural heritage data predicts sea-level rise impacts on building complexes. Canada's Borealis AI cloud platform collaborates with universities on the "Let's Solve It" project, which optimises public bicycle dispatch models using urban traffic data.

Digital archiving: Employing intelligent image recognition and digital modelling techniques to digitally reconstruct traditional offline data. For instance, Changsha University's "Digital Han Life" project digitally develops Han Dynasty cultural patterns and symbols.

Interactive simulation: Employing image and speech AI recognition alongside large-model data training systems to deliver human-like auxiliary training. For instance, Huazhong University of Science and Technology's "AI for the Deaf: Letting Love Be Heard" volunteer initiative, where the "Golden Cicada Seed" team independently develops an AI lip-reading assistance training system.

The Domestic Higher Education Sector Boasts a Substantial Base of Volunteer Services, Yet Suffers From Insufficient Engagement. Management Platforms Face Both Regulatory Compliance Issues and Structural Contradictions

By July 2025, the nation has 239 million registered volunteers, with over 135 million being university students, accounting for nearly 50% of the total. However, only 36.7% (87.73 million recorded working hours)

are effectively active volunteers, with a large number of "invisible participants" failing to sustain their involvement in voluntary service. A "tick-box approach" to volunteering remains prevalent. Leveraging official platforms such as the China Volunteer Service Network and Volunteer Hub, university volunteering has achieved digital management of registration, project publication, and hour recording. This has been integrated into various aspects including comprehensive student evaluations and scholarship assessments. The volunteering model continues to evolve, management processes are constantly optimised, brand development deepens, and evaluation systems are continually refined.

Nevertheless, the technological application of digitally empowered innovative practices in university volunteering remains superficial, and data risks are prevalent. Statistics indicate that approximately 60% of projects only achieve basic informatisation (such as online registration) without advancing to data-driven decision support. Regarding sustainable development, due to insufficient analytical capabilities and information security concerns, the interoperability, openness, and in-depth processing of volunteer service data remain inadequate. Collected data are not scientifically analysed for student quality assessment or institutional service decision-making. Volunteer service design lacks pre-established quality indicator systems for high-quality development, neglecting the quantitative evaluation of volunteer services as social capital outputs post-digital empowerment. Concurrently, attention must be paid to potential privacy risks for vulnerable beneficiary groups and value-testing issues arising from transnational collaborations. Volunteer service data suffer from an overemphasis on quantity over quality, with a notable absence of process-oriented behavioural data and prominent risks of sensitive information leakage. Volunteer service platforms lack robust privacy protection mechanisms.

Practical Pathways

Foundation-Building: Establish the Intrinsic Drivers and Policy Framework for Technological Innovation, Promoting the Intelligent and Institutionalised Development of University Volunteer Services

Innovation is the primary driver of development. Firstly, the nation must continue strengthening its artificial intelligence infrastructure, further expanding the capacity and coverage of its national grid to provide robust operational support for digital services. Concurrently, it should advance the digital transformation of traditional energy manufacturing to reduce national economic operating costs. Secondly, shorten the conversion cycle for AI technologies and application platforms. The government may centrally design and establish a unified volunteer service source platform embedded with AI technology, enabling volunteer service organisations to develop customised functionalities systematically upon this technological foundation. Finally, prioritise the storage, processing, openness, and integration of data during intelligent transformation. For instance, establish a volunteer service data integration and sharing platform to facilitate intelligent decision-making by volunteer organisations through digital means.

Strengthen top-level policy support. Firstly, refine institutional frameworks. China has already pioneered robust national strategic and policy support for AI-empowered education, outlining development priorities for smart education across basic, vocational, higher education, and lifelong learning. The government should collaborate with science and technology, charitable, mass organisations, and education departments to issue action guidelines and development blueprints for AI-empowered high-quality social volunteering in the new era. These should specify the pace of intelligent transformation for volunteering in higher education. Secondly, establish unified standards. Addressing current challenges in the digitalisation of university volunteer services—

such as technical bottlenecks, evaluation gaps, and data security risks—the state should actively advance legislation on volunteer services. Concurrently, local authorities and relevant departments should issue implementation rules, incorporating emerging AI considerations into existing policy frameworks. This would provide clearer temporal and spatial implementation for regulations concerning: access management for digital volunteer service platforms; standards for utilising individual volunteer data; privacy safeguards for beneficiary groups; provisions for cooperation with external organisations; and practical guidelines for deploying emerging technologies. Thirdly, synergistic mechanisms should encourage diverse societal actors to participate in the intelligent development of university volunteering. This entails strengthening the synergistic potential of governmental coordination, corporate funding, and exemplary roles played by social organisations. For instance, the "AI4Education: University Student AI Empowerment for Rural Education Public Welfare Initiative" integrates the national appeal of the "Knowledge-Action Programme" volunteer brand, social funding support, the international strengths of non-profit organisations (NPOs), corporate technological reserves, and university student resources. It establishes a collaborative mechanism for university student volunteering that connects "government-funding-international-technology-universities". Fourthly, international cooperation: on one hand, proactively expanding digital empowerment activities for youth volunteering into the international sphere to amplify China's youth digital-intelligence volunteering voice globally; on the other, scrutinising the progress and effectiveness of international AI-assisted volunteering from ethical, data security, and cultural preservation perspectives, while initiating monitoring mechanisms for ethical verification, data protection, and value safeguarding during cross-border volunteering practices involving Chinese youth.

Alignment: Enhance the Balanced Integration and Allocation Efficiency of Resources, Improving the Intelligent Integration of University Volunteer Services

Develop an intelligent platform for volunteer services. Embrace technological innovation to digitally empower the entire volunteer service process, such as employing big data analytics to manage volunteer databases and process service information, and utilising image semantic technology to convey deeper meanings through visual content. Prioritise openness and inclusivity over closed systems. The platform's design must permit self-redevelopment by enterprises, universities, and all societal organisations. Its connectivity should transcend the temporal and spatial constraints of traditional donor-recipient relationships, incorporating social care institutions, charitable organisations, insurance providers, government bodies, and media outlets. Integration with local one-stop service portals could transform volunteer registration into universal participation, mitigating digital divide issues such as potential neglect of vulnerable groups in university-led youth volunteering initiatives. Prioritise data integration functionality by embedding preliminary data screening, intelligent analysis, and tiered data access controls. Provide real-time predictive recommendations to volunteer decision-making bodies through built-in analytical models, while implementing intelligent monitoring and anti-misuse safeguards for service process information.

Needs assessment and targeted matching: Firstly, precisely segment the individual needs of volunteer service recipients. Addressing the research finding that university volunteer initiatives often prioritise personal interests over service delivery, higher education institutions should shift their design approach from subjectively assuming "what recipients need" to objectively identifying "who they are and what they desire". AI technology can assist university volunteers in identifying potential vulnerable groups within society, capturing individual needs, and forming precise profiles of service recipients. For instance, organisations such as elderly care

communities, wellness institutions, and hospitals operating under government oversight may appropriately disclose internal data on elderly care expectations, health assessments, individual challenges, and interests via intelligent platforms. Through big data modelling and predictive recognition technologies, pre-generate categorised demand lists for emotional companionship, knowledge dissemination, disease monitoring, and equipment assistance. Simultaneously, based on existing supply characteristics—such as university specialisations, course schedules, existing volunteer teams, and locations—intelligent pre-allocation proposals can be generated for institutional decision-making and matching. Secondly, higher education volunteer services should transcend conventional constraints of time passivity and proximity-based organisation. Innovative service formats should enable cross-disciplinary and cross-regional service integration. For instance, drawing inspiration from Denmark's "Be My Eyes" micro-volunteering platform for the visually impaired, artificial image and voice recognition technology could remotely connect visually impaired individuals with sighted volunteers. These volunteers would serve as visual assistants, resolving immediate difficulties through online support. AI-powered information interpretation renders disability support services feasible regardless of geography, nationality, time constraints, or professional background.

Supply Assurance: Guarantee the Quality of Service Provision and Management Effectiveness, Strengthening the High-Quality Output of University Volunteer Services

Firstly, enhance management efficiency. Higher education institutions must prioritise the efficient and precise operation of volunteer management modules—including volunteer coordination, service progress tracking, and service effectiveness feedback—through intelligent management platforms. Continue to enhance technological means for intelligent optimisation across the entire service process. For instance, the national volunteer service mobile platform "Volunteer Hub" supported the online activity system for the "Little Leaf Home" volunteers at the Shanghai Import Expo, while Fuzhou's Digital Summit implemented an integrated volunteer management system combining training, testing, and role allocation. Utilising video surveillance cameras, GPS positioning, AI image recognition, and data computation technologies enables the digital transformation of volunteer data, application in large-scale event service domains, and data-visualised decision-making. Secondly, enhance the application of intelligent data analysis to dynamically align and adjust volunteer behaviour, service feedback, and service process data with matching layer requirements. Concurrently, explore developing intelligent application devices integrated into management platforms—such as one-touch call and positioning functions—to bolster university student volunteer safety. This will transform the current state of higher education volunteer services in China, which prioritises quantity over quality.

Secondly, enhance personnel training. On one hand, China has introduced policies for AI-empowered education and launched nationwide online training for intelligent teaching staff. Focusing on university volunteer services, institutions can utilise AI virtual simulation technology to create AI volunteer trainers. These can conduct simulated interactive training for students on volunteer culture, service communication, professional skills, intelligent application capabilities, physical and mental health, and legal safety awareness, thereby ensuring the quality of volunteer service delivery. Secondly, cultivate long-term AI talent reserves. The OECD and EU have jointly released an AI literacy framework for primary and secondary schools, while the US has enacted legislation to advance youth AI education. China has also issued guidelines for AI education in K-12 settings. As a potent youth force, university volunteer groups require the establishment and implementation of long-term competency frameworks.

Thirdly, foster sustainable development. Under the imperative of advancing new productive forces, emphasis is placed on societal sustainability. The high-quality development of university volunteer services must also consider three key dimensions: cultural, attitudinal, and safety-related. Firstly, regarding the potential risk of homogenised content generation stemming from AI-enabled technologies, volunteer initiatives should uphold a human-centred principle. This ensures ideological guidance within Chinese universities, preserves sufficient creative space for diverse service formats, and safeguards the exploration of AI-assisted volunteer models with distinctive Chinese characteristics. Secondly, technologies such as big data-driven precision targeting should be leveraged to promote exemplary volunteer outcomes and societal benefits among university populations, thereby sustaining young people's long-term motivation. Concurrently, an intelligent safety framework for university volunteering must be established, clarifying provisions for fairness, monitoring and verification of generative AI-generated false content, student data privacy, and ethical standards.

Conclusion

In summary, this paper focuses on the high-quality development of youth volunteer services in higher education institutions, examining the potential drivers offered by new forms of productive forces. By synthesising current case studies of how universities leverage emerging productive forces in volunteer service delivery, it identifies developmental characteristics of digital volunteer services at macro, supply-demand, and management levels. Consequently, it proposes constructive recommendations and approaches concerning policy frameworks, resource allocation, and service provision to further advance the high-quality development of volunteer services within China's higher education.

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