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Digital Transformation of Entrepreneurship Education in Chinese Higher Education: Trends, Challenges, and Strategic Responses

Yangfan Zheng[1], Dr.Samah Almaki[2]
[1]*City Graduate School,City University,Malaysia*
461352389@qq.com
[2]*Faculty of Education and Liberal Studies,City University,Malaysia*
dr.samah@city.edu.com

Abstract: *The digital transformation of higher education in China has profoundly reshaped entrepreneurship education, creating both opportunities and challenges. With the rise of artificial intelligence, big data, cloud computing, and other emerging technologies, the digital economy serves as a key driver for reforming talent cultivation models and entrepreneurial ecosystems. Entrepreneurship education in Chinese universities has evolved to break traditional boundaries, expand learning spaces, and foster innovative practices through digital tools and platforms. Emerging trends include interdisciplinary integration, personalized learning paths, virtual incubation environments, and international collaboration. Nevertheless, persistent obstacles remain: outdated cultivation models, fragmented educational systems, insufficient practice-oriented platforms, and incomplete evaluation mechanisms. Strategic responses involve enhancing policy support and cultural guidance, rethinking educational philosophies and curricula, strengthening faculty digital competence, and improving experiential learning systems. By integrating national strategies with technological innovation, Chinese higher education institutions can nurture entrepreneurial talents with strong digital literacy, cross-disciplinary skills, and global vision. These insights highlight the potential of digital transformation to advance innovation and entrepreneurship education in the new era.*

Keywords: *Digital Transformation; Entrepreneurship Education; Higher Education; AI*

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1. Introduction

With the rapid evolution of digital technologies, the digital economy, as an emerging form and development model, has gradually become a core driver of economic growth and is profoundly reshaping human modes of production (Lei & Chen, 2021). The openness, cross-border integration, and high interactivity of the digital era not only place new demands on the efficiency of entrepreneurial actors but also set higher standards for the talent cultivation objectives of innovation and entrepreneurship education in universities. Higher education institutions must respond to these demands by nurturing entrepreneurial talents who not only possess a solid foundation of knowledge and technology but also demonstrate sustained growth potential and high value-added capabilities (Bao, 2020). The development of artificial intelligence, in particular, is reshaping talent structure and competency requirements, thereby compelling reforms in innovation and entrepreneurship education while serving as a technological enabler in teaching and learning processes. Therefore, aligning with the new requirements of the digital economy era, exploring new trends, challenges, and strategies in university entrepreneurship education has become a critical issue for higher education in the new era.

2. Entrepreneurship Education in the Digital Era

2.1 Evolution of Entrepreneurship Education in Chinese Higher Education

Entrepreneurship education began to enter higher education systems in the 1980s (He & Wen, 2023). In Europe and the United States, its early development was largely rooted in business schools, where curricula primarily focused on entrepreneurial financing, business plan writing, and enterprise management. With the deepening of practice, many international universities established comprehensive support structures, such as incubators, makerspaces, and cross-border collaboration programs, in order to provide students with entrepreneurial boot camps, mentorship from industry experts, and practical financing opportunities. These initiatives facilitated a more seamless integration of classroom learning with entrepreneurial practice, contributing to the development of a relatively mature ecosystem of entrepreneurship education. This trajectory underscores the international emphasis on both the practical orientation and systematic construction of entrepreneurship education.

In contrast, entrepreneurship education in Chinese universities started relatively late but has experienced exceptionally rapid growth. Since the launch of the “Mass Entrepreneurship and Innovation” strategy in 2015, entrepreneurship education has gradually evolved into a vital component of higher education talent cultivation. According to data from the Ministry of

Education, approximately 82% of universities nationwide have introduced compulsory or elective courses on innovation and entrepreneurship (Bao, 2020). Moreover, a number of institutions have promoted the institutionalization and systematization of entrepreneurship education by establishing specialized entrepreneurship colleges, developing university science parks, and building makerspaces. At the same time, diverse approaches such as university–enterprise collaborations and entrepreneurial project practices have enriched the forms of education, contributing to a multifaceted support system that integrates curriculum teaching, project incubation, and outcome transformation. Collectively, these practices have, to some extent, compensated for the late start and enabled entrepreneurship education in Chinese universities to enter a phase of accelerated development.

It is noteworthy that the development of digital entrepreneurship education in Chinese universities has been closely intertwined with national strategic agendas. The Report of the 20th National Congress of the Communist Party of China emphasized the need to improve the institutional mechanisms supporting entrepreneurship-driven employment and to regulate the development of new employment forms. The 14th Five-Year Plan for Digital Economy Development further highlighted the advancement of smart education and the continued expansion of the "Internet+Education" initiative (Li, 2024). Similarly, the 14th Five-Year National Informatization Plan incorporated the goal of promoting lifelong digital education as a core component of ensuring inclusive digital public services (Guo, Bai, Guo, & Sun, 2022). These top-level designs not only provide macro-level policy guidance for educational digital transformation but also indicate that emerging technologies—such as cloud computing, big data, artificial intelligence, and blockchain—are becoming critical driving forces in upgrading entrepreneurship education toward digitalization.

At the level of specific policies and technological pathways, since the implementation of the "Internet+" and "Mass Entrepreneurship and Innovation" strategies, China has consistently promoted the deep integration of cutting-edge technologies such as AI and big data with education. In 2017, the State Council issued the Next Generation Artificial Intelligence Development Plan, which explicitly called for building a more comprehensive education system to cultivate talents with innovative spirit and entrepreneurial awareness (Zhao & Zhuang, 2023). Following this, the Ministry of Education and related departments launched typical application cases of "AI+Higher Education," thereby exploring new models of entrepreneurship education under the backdrop of digitalization. Entering a new era, the release and open-source availability of DeepSeek at the end of 2024 provided higher education with novel technological tools and innovative paradigms (Tian, Wang, & Luan, 2025). This development has profoundly transformed educational scenarios, teaching modalities, and management mechanisms, accelerating the evolution of the entrepreneurship education ecosystem toward greater intelligence, openness, and systematization.

In sum, within only a few decades, entrepreneurship education in Chinese universities has achieved a significant leap from its initial exploratory stage to systematic construction. Under the dual influence of national policy guidance and technological innovation, it is now rapidly advancing toward a stage characterized by digitalization, intelligentization, and ecological integration. This evolutionary trajectory not only reflects the guiding role of state strategies but also illustrates how technological transformation exerts both external pressure and internal momentum on the restructuring of the educational system.

2.2 The Transformative Impact of Digital Technologies on Higher Education and Entrepreneurship Education

The rise of digital technologies is profoundly reshaping the landscape of higher education, particularly by bringing both unprecedented opportunities and formidable challenges to entrepreneurship education.

2.2.1 Breaking the Boundaries of Traditional Entrepreneurial Contexts

Digital technologies have become a new driving force for entrepreneurship education in universities. They not only eliminate the limitations of traditional, space- and time-bound entrepreneurial models but also leverage big data to expand both the stock of entrepreneurial knowledge and the boundaries of individual entrepreneurial cognition, thereby stimulating new modes of entrepreneurial thinking. Consequently, the social transformation and economic shifts triggered by the development of digital technologies are bound to induce paradigm changes in entrepreneurship education (Teng & Li, 2024).

The digital economy is a major impetus for contemporary social development, encompassing "digital industrialization, industrial digitization, digital governance, and data valorization. It involves industries, management, and public services, covering both domestic and cross-border economies, with broad, complex content that has given rise to an increasing number of new business models and formats" (Zheng, 2022). Through enabling the seamless flow of information, knowledge, and resources across sectors, digital technologies strengthen inter-industry linkages and interactions, while effectively shortening the cycle between product design and market feedback. This, in turn, reduces research and development costs and accelerates product iteration.

Digital entrepreneurship is thus characterized by its low barriers to entry, high efficiency, and considerable flexibility. With the deep penetration of digital technologies, it provides more precise and effective solutions to complex and dynamic societal demands. Unlike traditional entrepreneurship, which often requires substantial financial and material inputs, digital entrepreneurship adopts platform-based, intelligent, and network-oriented models that

significantly reduce entry thresholds. This enables more individuals with innovative thinking and practical capabilities to engage swiftly in entrepreneurial activities. At the same time, digital environments grant entrepreneurial processes greater scalability and adaptability, as entrepreneurs can utilize real-time data analysis and market feedback to adjust their business models and strategies in response to rapidly changing external conditions.

Within this context, the “influencer economy”,rooted in traffic-driven dynamics has become a prominent manifestation of digital entrepreneurship. Social media platforms and livestreaming tools allow online influencers to quickly attract and sustain large fan communities, converting potential audiences into loyal consumer bases. This process not only fosters new modes of product distribution and consumer experiences but also promotes the emergence of diversified market channels and digitized supply chains, ultimately generating novel economic forms with significant agglomeration effects and market-driving power. Digital platforms thereby play a critical role in resource allocation, market expansion, and consumption guidance.

In sum, digital technologies, by converting objective phenomena into “bits” and facilitating the free flow of information, knowledge, and resources, have emerged as a core driver of enhanced economic performance. They not only foster new forms of entrepreneurship and industrial structures but are also reshaping the content and modalities of entrepreneurship education in universities. Consequently, higher education institutions, in cultivating entrepreneurial talents, must recognize both the opportunities and challenges brought by digital technologies and proactively guide students to leverage digital tools to strengthen entrepreneurial cognition and practical competencies, thereby equipping them for the entrepreneurial environment of the digital economy era.

2.2.2 Paradigm Shifts and the Digital Transformation of Entrepreneurship Education

The digitalization of industry has provided more reliable technological tools and service support for entrepreneurship education, thereby accelerating its digital transformation. Rather than merely updating teaching instruments, digital entrepreneurship education builds on fundamental educational concepts and leverages technologies such as intelligent algorithms, artificial intelligence, and blockchain to unlock the value of data and release the potential of the technological ecosystem.

First, the deepening application of technology has expanded and upgraded entrepreneurship education spaces. These spaces encompass both knowledge platforms and practice platforms. Unlike the traditional focus on optimizing physical venues, digital transformation emphasizes the interconnection and sharing of resources as well as the creation of boundaryless learning

environments. In terms of infrastructure, digital technologies not only enhance conventional conditions such as internet connectivity, computers, projectors, and interactive devices but also enable the construction of innovative educational environments through immersive tools like AR and VR. Examples include smart classrooms, virtual entrepreneurship practice spaces, digital innovation research centers, and AI laboratories. In terms of learning experience, digital technologies enhance immersion, interactivity, and engagement, granting learners greater autonomy and recognition (Chen & Li, 2024). With the support of emerging technologies such as digital twins, 5G, and AI, it is now possible to create an "educational metaverse" that integrates knowledge and practice platforms, driving the comprehensive digital transformation of entrepreneurship education models.

Second, the integration of digital technologies into governance processes has optimized and reshaped the structure of entrepreneurship education. Digital governance serves as a critical pillar in the transformation of the entrepreneurial education ecosystem. Acting as a mediator, digital technologies fulfill both material functions as tools and value functions at the conceptual level, thus facilitating systemic reform. On one hand, they reconstruct the networked relationships between curriculum, knowledge platforms, practice platforms, and organizational management, thereby enhancing efficiency and responsiveness. On the other hand, digital tools and platforms enable comprehensive, real-time supervision and management, strengthening the transparency, scientific rigor, and reliability of the system and accelerating the formation of a robust digital governance framework for entrepreneurship education.

Finally, the infusion of digital thinking is reshaping educational concepts and cognition, driving the cultural evolution of entrepreneurship education. Characterized by efficiency and the fusion of virtual and real, digital thinking not only transforms modes of production and daily life but also subtly alters the cognitive patterns of entrepreneurship education participants, giving rise to a "digital culture." This culture, in turn, redefines institutional perceptions and behavioral norms in the digital era. In essence, technological transformation represents a form of cultural transformation. Traditional entrepreneurial education culture no longer meets the demands of digital development. It is therefore essential to construct a new cultural framework grounded in digital technologies and data resources, with a core focus on cultivating innovative talents and fostering a spirit of creativity. Such a culture should embody co-evolution, openness, inclusivity, and the integration of virtual and real, serving as the cognitive foundation for building a digital entrepreneurship education ecosystem.

Overall, emerging technologies such as AI, big data, and cloud computing are profoundly empowering entrepreneurship education in higher education institutions, promoting systemic change in teaching methods, governance models, and entrepreneurial ecosystems.

Nevertheless, challenges such as the digital divide, unequal distribution of educational resources, and insufficient digital literacy among educators remain critical bottlenecks for the full implementation of digital transformation.

3. Emerging Trends and Opportunities in the Digital Era

Against the backdrop of the rapidly developing digital economy, entrepreneurship education in universities is undergoing profound transformation. Emerging technologies such as artificial intelligence (AI), big data, cloud computing, and blockchain are not only restructuring the economy and society but also creating new spaces for the advancement of entrepreneurship education. Compared with traditional approaches that relied heavily on classroom instruction, case studies, and offline incubators, entrepreneurship education in the digital era emphasizes interdisciplinary integration, resource sharing, and diversified learning pathways. It is increasingly characterized by the deep integration of online and offline modalities, the global circulation of educational resources, and the virtualization of practical learning contexts.

The digitalization of educational models has become a defining trend. Supported by online course platforms, virtual incubators, and intelligent simulation systems, universities can overcome temporal and spatial constraints to provide students with more flexible and diverse entrepreneurial learning environments. This model not only broadens the boundaries of learning but also enhances the accessibility and inclusiveness of entrepreneurship education. In the future, virtual incubators and entrepreneurial simulation systems will enable students to engage in entrepreneurial practices across time and space, reduce trial-and-error costs, and improve the efficiency of project implementation. With the further development of immersive technologies such as AR and VR, entrepreneurship education is expected to achieve more realistic scenario simulations and practical experiences.

At the same time, the application of big data and AI is driving greater precision and personalization in entrepreneurship education. By analyzing students' learning behaviors and entrepreneurial project data, universities can dynamically optimize teaching content, develop differentiated learning pathways, and implement more tailored instruction. Students, in turn, can leverage data for industry analysis, market forecasting, and consumer insights, thereby formulating more evidence-based entrepreneurial strategies. Digital platforms and intelligent tools can also track the progress of entrepreneurial projects in real time, enabling students to identify problems and optimize decisions promptly, which substantially enhances the scientific rigor and efficiency of entrepreneurial practices.

Moreover, the widespread adoption of digital technologies has lowered barriers to cross-industry and cross-regional collaboration, creating new opportunities for industry-education integration and international cooperation. On the one hand, universities and enterprises can jointly establish laboratories, industry-focused colleges, and co-incubators to integrate industrial and educational resources, thereby bridging theoretical knowledge with market demands and improving both innovation capacity and entrepreneurial outcomes. On the other hand, digital platforms transcend geographical boundaries, expanding the scope of international cooperation in entrepreneurship education. Cross-border online courses, joint incubation projects, and international entrepreneurship competitions allow students to engage in entrepreneurial practices within a globalized context, thereby strengthening cross-cultural communication skills and international competitiveness.

In summary, digital transformation is opening up new opportunities for the restructuring of educational models, the innovation of teaching pathways, and the expansion of global cooperation in entrepreneurship education. On the one hand, digital technologies are driving systemic changes in educational models, talent cultivation, and entrepreneurial ecosystems. On the other, universities can leverage external resources and international partnerships to cultivate entrepreneurial talents equipped with digital literacy, interdisciplinary competence, and a global vision. Future entrepreneurship education will extend beyond the transmission of knowledge and skills, fostering instead digital thinking, an innovative mindset, and global competitiveness, thereby injecting sustained momentum into the high-quality development of the economy and society.

4.Challenges of Innovation and Entrepreneurship Education in the Digital Era

4.1Outdated Talent Cultivation Models Misaligned with the Demands of the AI Era

Against the backdrop of rapid advances in artificial intelligence, traditional talent cultivation models in innovation and entrepreneurship education have become increasingly inadequate in meeting the demands of the intelligent era. As robots and intelligent systems gradually replace standardized and routine tasks, human labor is shifting toward domains that emphasize creativity, adaptability, and continuous learning. At the same time, AI is reshaping traditional industries and generating emerging sectors and new occupations, raising the bar for talents' innovative capacity and self-directed learning skills, thereby creating a pronounced shortage of innovation-oriented and AI-competent talents (Han, Hu, & Wang, 2023). Although entrepreneurship education holds significant value in the AI era, a clear disjunction persists between educational objectives, curricular content, and market demands. Existing courses largely remain anchored in conventional theories that emphasize physical knowledge and tangible resources, while insufficiently responding to the entrepreneurial waves driven by artificial intelligence. This reality underscores the urgent need for

universities to systematically reform their training objectives, curriculum structures, and teaching content.

4.2. Fragmented Education Systems and Limited Synergy

Currently, entrepreneurship education in many universities lacks a coherent, ecosystem-oriented framework. Weak integration across curricula, faculty resources, social capital, and practice platforms results in blurred role definitions and inefficient resource utilization (Xu, Wu, Sun, & Liu, 2024). In addition, some institutions demonstrate insufficient awareness of digital transformation (Yang & Luo, 2025), failing to fully integrate emerging technologies such as artificial intelligence and big data throughout the talent cultivation process. Consequently, entrepreneurship education suffers from limited systematicity and foresight. These deficiencies manifest in the lack of interdisciplinary integration, inadequate university–enterprise collaboration, and weak resource coordination, which collectively constrain the overall effectiveness of entrepreneurship education.

4.3. Monolithic Teaching Approaches and Theory–Practice Disconnect

At present, entrepreneurship education in most universities continues to rely heavily on classroom lectures, with an overemphasis on theoretical knowledge at the expense of experiential training (Ma & Hua, 2024). As a result, students find few opportunities to enhance their competencies in authentic entrepreneurial settings. While competitions have provided some opportunities to bridge theory and practice, practice platforms remain underdeveloped, and immersive, cross-disciplinary, and diversified learning environments are scarce. Furthermore, AI-enabled smart education concepts have not been widely adopted; applications such as virtual reality and human–machine collaborative teaching are still limited within entrepreneurship education. Outdated educational spaces and instructional resources fail to meet the increasingly diverse learning needs of students.

4.4. Incomplete Evaluation Systems that Fail to Capture Students' True Competence

The current evaluation frameworks for innovation and entrepreneurship education are often characterized by overly complex indicators, limited practicality, and weak implementation, lacking a dynamic, multi-stakeholder mechanism that spans the entire educational process. As a result, students' innovative spirit, interdisciplinary integration capabilities, and digital entrepreneurship skills are not adequately assessed, limiting the value of evaluation outcomes for informing educational improvements and guiding talent cultivation. Meanwhile, AI-powered teaching and learning are reshaping educational spaces, pedagogical approaches, and resource allocation, yet traditional evaluation mechanisms have not evolved in tandem. This gap prevents the effective measurement of new competencies developed within intelligent learning environments. It highlights the imperative for future entrepreneurship

education evaluation systems to transition from static, single-dimensional indicators toward dynamic, multidimensional frameworks.

5. Strategic Responses for High-Quality Development

As a forward-looking educational endeavor, innovation and entrepreneurship education must align with the dynamics of the times, integrate technological progress, and remain closely connected to industrial transformation. While the digital era creates unprecedented opportunities for entrepreneurship education in Chinese universities, it also exposes a range of persistent challenges, including fragmented teaching systems, outdated talent cultivation models, insufficient faculty resources, weak policy implementation, and underdeveloped evaluation mechanisms. Without systematic interventions, these shortcomings hinder the ability of higher education to meet the demands of the digital economy and societal transformation. To address these issues, coordinated efforts are required across multiple dimensions, including policy and institutional frameworks, educational philosophy, faculty development, and practical training platforms. By leveraging the synergistic roles of diverse stakeholders, universities can advance innovation and entrepreneurship education toward high-quality and sustainable development.

5.1 Strengthening Policy Frameworks and Cultivating Entrepreneurial Culture

The development of innovation and entrepreneurship education (IEE) in China demonstrates a typical "government-driven" model, in which well-designed institutions and sound policy support are critical to ensuring high-quality progress (Ma & Meng, 2022). First, the policy and legal framework should be further enhanced, with strengthened earmarked funding and accelerated development of industrial parks, incubators, and makerspaces to provide a stable external environment for innovation and entrepreneurship among university faculty and students. Second, deeper integration of industry, academia, and research must be promoted. Governments should establish collaborative platforms to facilitate long-term cooperation between universities and industries, pooling technologies and resources to align scientific research outcomes with enterprise needs. This would form a full-chain model encompassing research, incubation, and commercialization, thereby advancing the translation of scientific achievements into practice.

Third, the construction of an entrepreneurial and innovative culture should be emphasized. Through policy guidance and public discourse, governments can enhance societal recognition and support for innovation and entrepreneurship, cultivating a positive value orientation. Moreover, efforts should be made to integrate traditional culture with entrepreneurial culture, promoting craftsmanship and a sense of national responsibility to enrich the cultural

foundation of IEE. Importantly, cultural development should not rely solely on the government but requires collaboration among universities, enterprises, and society at large to jointly build educational and communication platforms. Such collective efforts can foster positive interaction and social synergy. Only under the dual safeguards of institutional frameworks and cultural foundations can a favorable ecosystem be established to support the sustainable development of innovation and entrepreneurship education.

5.2. Reshaping Educational Philosophy and Curriculum Systems

Driven by the digital wave, the philosophy of entrepreneurship education in China urgently requires renewal. As the birthplace of entrepreneurship education, universities should adopt a technology- and knowledge-oriented approach that not only cultivates high-quality talent for society but also aligns with regional economic needs and institutional development strategies. This involves establishing forward-looking educational philosophies and integrating innovation, interdisciplinarity, and sustainability into curricular objectives.

At the practical level, universities should prioritize talent cultivation in artificial intelligence (AI) and related fields, promoting the deep integration of AI with traditional disciplines and entrepreneurship education. Such integration can enable students to rationally assess both the opportunities and challenges brought by technological advancement while enhancing their interdisciplinary understanding and capacity to solve complex problems. Teachers, meanwhile, must transform their roles from mere transmitters of knowledge to facilitators of collaborative learning, actively leveraging digital technologies and hybrid teaching models. Efforts should be made to advance the development of "Internet + smart campus" ecosystems, ensuring the comprehensive incorporation of digital technologies into entrepreneurship education.

In terms of curriculum, greater emphasis should be placed on the integration of theory and practice, facilitating the transformation and sharing of information into knowledge. Furthermore, curricula should highlight personalization and practice-oriented training by designing entrepreneurship courses that resonate with students' interests and disciplinary backgrounds. Such efforts can promote the deep integration of professional and entrepreneurial education, thereby comprehensively enhancing the quality and effectiveness of talent cultivation.

5.3 Faculty Development and Capacity-Building in the Digital Era

In the digital era, enhancing the quality of innovation and entrepreneurship education in Chinese universities depends fundamentally on building a high-level faculty team and a diversified talent cultivation system.

First, in terms of faculty development, it is essential to adopt the principle of "teaching through competition." By encouraging faculty members to guide students in participating in innovation and entrepreneurship contests such as "Internet+," "Challenge Cup," and "Chuangqingchun," universities can strengthen teachers' understanding of cutting-edge entrepreneurial models and industrial trends. At the same time, students are provided opportunities to broaden their thinking and hone practical abilities in real-world contexts, thereby achieving an organic integration of knowledge transmission and competence development. This model not only enriches teaching methods but also promotes diversification and flexibility in education.

Second, universities should establish systematic faculty training and practice mechanisms. This includes supporting teachers' participation in domestic and international entrepreneurship education training programs, enterprise-based placements, and innovation practice projects, which can foster the renewal and expansion of their educational philosophies, knowledge structures, and pedagogical approaches.

Third, external resources should be leveraged to strengthen teaching capacity. Universities can actively recruit faculty with rich entrepreneurial experience and outstanding entrepreneurs to engage in short-term teaching, part-time roles, or mentorship programs. The integration of internal and external faculty resources not only enhances the overall level of teaching staff but also provides students with dual academic and practical perspectives, thereby fostering a hybrid guidance model that combines theory with practice.

Finally, on the talent cultivation front, universities should emphasize personalized student development and promote the deep integration of professional and entrepreneurial education. By combining competition training, practice-oriented courses, and innovation projects, students can be guided to improve their innovative capabilities and entrepreneurial literacy within interdisciplinary contexts. Overall, following the pathway of "competition-driven learning—training enhancement—university-industry integration—personalized cultivation" can continuously optimize faculty development and talent cultivation systems, laying a solid foundation for nurturing high-quality talents with innovative spirit and practical competence in the digital age.

5.4 Expanding Practice Platforms and International Collaboration

Digital platforms for innovation and entrepreneurship education serve as a crucial guarantee for establishing a new digital ecosystem. Such platforms not only promote collaboration and symbiosis among innovation stakeholders but also provide a reliable digital environment for the transformation and upgrading of entrepreneurial education, thereby enhancing the innovative efficiency of the ecosystem (Chen & Li, 2024). The development of co-constructed, shared, and symbiotic digital platforms is essential to ensuring fairness in innovation and entrepreneurship education. Specifically, universities should build digital resource platforms, digital management platforms, and digital application platforms underpinned by emerging technologies. These platforms may include intelligent practice environments, interactive smart classrooms, and immersive virtual simulation laboratories. By supporting multi-terminal access, self-directed learning, dual-teacher classrooms, and other application scenarios, digital platforms can inspire students' innovative spirit and cultivate their entrepreneurial competencies.

From a broader perspective, digital platforms that integrate high-quality educational resources enable on-demand supply and precise delivery, thereby advancing fairness through digitalization, personalization, and precision-driven approaches. Meanwhile, higher education institutions should strengthen industry–education integration by collaborating closely with enterprises, research institutes, and social capital to co-create innovation ecosystems. Universities should also expand intercollegiate partnerships and introduce international resources to broaden students' global perspectives and collaborative opportunities, enhancing the openness and competitiveness of entrepreneurial education.

In the digital era, innovation and entrepreneurship education in Chinese universities urgently requires reliance on digital platforms to construct a collaborative and symbiotic innovation ecosystem. First, universities should employ digital technologies as foundational support to establish integrated platforms for resource sharing, smart management, and interactive applications, including intelligent practice arenas, interactive classrooms, and immersive simulation training spaces. These platforms, by enabling multi-terminal use, autonomous learning, and dual-instructor models, not only stimulate students' creativity but also effectively improve entrepreneurial capabilities. Second, industry–education integration and university–enterprise co-construction should be reinforced. By uniting enterprises, research institutions, and social investors, universities can establish shared ecosystems that align educational resources with industrial needs through research–teaching–practice integration. Third, cross-institutional cooperation and internationalization of resources should be expanded to provide students with intercultural and cross-regional opportunities, thereby enhancing openness and competitiveness. On this basis, universities can further realize

educational equity and precision supply. Through big data analytics and intelligent recommendation systems, digital platforms allow for tailored resource allocation, advancing innovation and entrepreneurship education toward greater personalization, fairness, and efficiency, ultimately boosting the overall effectiveness of the educational ecosystem.

6.Conclusion and Future Outlook

In summary, innovation and entrepreneurship education in Chinese universities faces multifaceted challenges in the digital era, including conceptual renewal, institutional improvement, faculty development, and resource allocation. At the same time, it also encounters unprecedented opportunities for growth. This study proposes countermeasures from four dimensions—policy and cultural guidance, curriculum system reconstruction, faculty optimization, and digital ecosystem construction—with the aim of providing a systematic pathway for the high-quality development of entrepreneurial education. These initiatives not only respond to the practical demands of technological advancement and industrial upgrading but also lay the foundation for building an open, collaborative, and shared educational ecosystem.

Looking ahead, universities should capitalize on policy support to reinforce their educational and research strengths, while building closer partnerships with industry and society. By advancing both internal reforms and external collaborations, higher education can foster innovative, practice-oriented, and globally minded graduates, thus providing lasting momentum for economic transformation in the digital era.

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