

The Value, Difficulties and Approaches of Cultivating Digital Literacy Among College Students Under the Background of Digital China Construction

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Abstract: Digital literacy cultivation of college students is a basic project for universities to support the construction of Digital China, a powerful way to cope with new forms of employment, a key measure to promote the cultivation of innovative talents, and a powerful factor to trigger educational ecological innovation. The cultivation of digital literacy among college students generally faces practical difficulties such as lagging educational concepts and goal orientations, outdated curriculum systems and teaching content, insufficient resource supply and guarantee conditions, and uneven student ability foundation and development. Colleges and universities urgently need to provide sufficient talent supply for the development of Chinese-style modernization by building a full-cycle systematic training system, creating a hierarchical and classified adaptive teaching system, improving all-round collaborative support capabilities, and stimulating students' independent improvement and practical application efficiency.

Keywords: Digital China; College students; Digital literacy

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1. Introduction

The communiqué of the Fourth Plenary Session of the 20th Central Committee of the Communist Party of China pointed out that we should seize the historical opportunities of the new round of scientific and technological revolution and industrial transformation, coordinate the construction of a strong country in education, science and technology, and a strong country in talent, improve the overall efficiency of the national innovation system, comprehensively enhance independent innovation capabilities, seize the commanding heights of scientific and technological development, and continuously generate new productive forces. It is necessary to strengthen original innovation and key core technology research, promote the deep

integration of scientific and technological innovation and industrial innovation, promote the development of educational scientific and technological talents, and further promote the construction of Digital China^[1]. In April 2025, nine departments, including the Ministry of Education, issued the “Opinions on Accelerating the Digitalization of Education”, which clearly proposed to formulate and improve digital literacy standards and artificial intelligence application guidelines for teachers and students, carry out literacy improvement practical activities and surveys and evaluations, and improve digital literacy and artificial intelligence application levels^[2]. Colleges and universities are the key connection point for the integrated promotion system of education, science and technology talents. Actively play the guiding and supporting functions of colleges and universities in talent training, focus on improving the digital literacy of college students, and enhance the talent supply capacity of colleges and universities in serving major national strategies and regional economic and social development. This is the current key task that our country’s colleges and universities must urgently focus on.

2. The value and implications of cultivating digital literacy among college students

2.1. Strategic value: The basic project supporting the construction of Digital China

The construction of Digital China is of great significance and far-reaching impact on comprehensively building a modern socialist country and comprehensively promoting the great rejuvenation of the Chinese nation. Laborers are the most active factor in productivity. First of all, colleges and universities are the main field for cultivating high-quality workers. By strengthening the cultivation of digital literacy among college students, they can guide and stimulate the expansion and efficiency of digital competency training in aspects such as educational resources, industry-education integration, and technological empowerment, improve the digital application capabilities of high-quality talents, and provide talent guarantee for serving the construction of Digital China. Secondly, as the pace of comprehensive reform of higher education continues to advance, the scientific research and social service functions of universities have been continuously strengthened, and the depth and breadth of integration with the coordinated development of regional industries have been continuously strengthened. Through college students’ participation in scientific research, social services and other production practices, college students’ digital literacy capabilities can be effectively transferred to the front lines of social production, and the mutual integration and promotion of university talent output and industrial technology input can be achieved.

2.2. Social value: A powerful way to deal with new forms of employment

Selected Works of Marx and Engels emphasizes: “The first premise of all human history is undoubtedly the existence of living individuals^[3].” In terms of my country’s current overall development trend, it is particularly critical to continue to expand the base of the “digital population” and improve the quality of the “digital population”. The “Recommendations of the Central Committee of the Communist Party of China on Formulating the Fifteenth Five-Year Plan for National Economic and Social Development” states: “In-depth implementation of the employment priority strategy, improvement of employment promotion mechanisms, and construction of an employment-friendly development model^[4].” Digital literacy has become the core competitiveness of youth employment. It is estimated that the digital talent gap in my country is between 25 million and 30 million, and this figure is still growing^[5]. On the one hand, the generation gap between the real demand for digital literacy of college graduates in the human resources market and the special cultivation

of digital literacy for college graduates will be effectively made up, and their competitiveness in the job market will be effectively improved. On the other hand, college students with good digital literacy and digital application capabilities can effectively make up for the shortage of digital specialized talent resources in the labor market through flexible employment, wide-scope employment, etc., improve human capital, and expand employment channels.

2.3. Empowering value: Key measures to promote the cultivation of innovative talents

In the context of the artificial intelligence era, the key to stimulating innovation and development lies in the cultivation of innovative talents, especially the construction of an innovative talent team with outstanding digital literacy^[6]. Innovation is an inherent requirement of reform and the first driving force for high-quality development. Comprehensively deepening reforms and promoting Chinese-style modernization is an unprecedented and pioneering undertaking. It also requires the cultivation of innovative talents to effectively connect the three strategic elements of education, technology, and talent, and continue to enhance the “internal driving force” for the development of Chinese-style modernization. At the same time, Chinese-style modernization is a modernization with a huge population. Only by promoting the high-quality development of the population through the cultivation of population digital literacy and guiding economic development to rely on the improvement of total factor productivity brought about by talent, innovation and efficiency improvement can we more effectively solve the main contradictions of my country’s current stage of population development.

2.4. Driving value: A powerful factor that triggers educational ecological innovation

It is profoundly changing people’s production, living, and learning styles, and promoting human society to usher in an intelligent era of human-machine collaboration, cross-border integration, and co-creation and sharing. With the rapid rise of artificial intelligence technology, higher education is accelerating into the stage of smart education. The continuous expansion of educational digitization in depth and breadth will inevitably have a transformative impact on the higher education ecology. Accompanying this change in education form, the chain-driving effect caused by the cultivation of digital literacy among college students will have a revolutionary reshaping of the talent training system in colleges and universities. This is highly consistent with the current emphasis on the strategic service function requirements of higher education. At the same time, in accordance with the requirements of cultivating college students’ digital literacy, new technologies represented by artificial intelligence technology will be widely used in the practical aspects of college student education, achieving coordination and unity of theory and tools in the field of higher education, and gradually forming a new ecology of higher education education and teaching in the digital era.

3. Realistic difficulties in cultivating digital literacy among college students

3.1. Educational concepts and goal positioning lag, and there are structural deviations in digital literacy cultivation

Under the requirements of the era of comprehensive advancement of Digital China, there are still common problems of lagging concepts and misaligned goals in cultivating students’ digital literacy in colleges and universities. From a conceptual perspective, most colleges and universities have not yet integrated digital literacy cultivation into the core system of talent training. Their thinking and concepts remain only at the

shallow level of “instrumental skills training”, and they have failed to carry out top-level design of the quality literacy cultivation system for college students from the perspective of digital survival, digital innovation, and digital governance. There is an obvious disconnect with Digital China’s strategic demand for high-quality digital talents. From a goal perspective, in the process of promoting smart campuses and digital campuses, most colleges and universities have not focused clearly enough on the cultivation of students’ digital literacy and digital abilities, and have failed to form a systematic training plan throughout the entire academic cycle. As a result, the improvement of college students’ digital literacy lacks a clear direction and stable support, and it is difficult to adapt to the requirements of the modernization of the digital economy and social governance for the core capabilities of talents.

3.2. The curriculum system and teaching content are outdated and difficult to adapt to technological iterations and practical needs

The lagging digital literacy curriculum system in colleges and universities and the slow update of teaching content are key bottlenecks that restrict the quality of cultivation. There is a lack of relevance in cultivating digital literacy among college students at the current stage. First of all, most of the existing courses in colleges and universities focus on traditional information retrieval and basic computer knowledge. The teaching content is seriously out of touch with the development of cutting-edge technologies such as big data, artificial intelligence, and generative AI. It cannot effectively respond to new technologies, new scenarios, and new professional needs in the construction of Digital China. Secondly, the methods for cultivating college students’ digital literacy are still mainly classroom lectures, with insufficient application of digital tools and intelligent platforms, a lack of personalized learning and “immersive” training, and a failure to meet students’ differentiated development needs. In terms of educational scenarios, the digital literacy cultivation of college students is mainly based on the internal campus field, and the cultivation of students’ practical training and practical abilities through the integration of industry and education, social services, horizontal projects and other carriers is insufficient, resulting in digital literacy education being out of sync with technological changes and not closely connected with real scenarios.

3.3. Resource supply and guarantee conditions are insufficient, and a collaborative cultivation mechanism has not yet been effectively formed

Digital literacy cultivation requires universities to coordinate multiple education entities such as industry, society, and families to provide sufficient educational resource guarantees. In terms of software and hardware support, the construction of digital infrastructure in some colleges and universities lags. There is an insufficient supply of smart laboratories, virtual simulation training platforms, and big data training environments. The degree of resource integration is not high. The resource sharing mechanism between schools and enterprises is imperfect. The differences in family capital and social capital support further exacerbate the uneven development of students’ digital literacy. In terms of teaching staff security, the number and quality of professional digital literacy teachers vary among universities. The teaching staff lacks systematic training and cutting-edge technology experience, making it difficult to carry out high-level teaching and practical guidance. In terms of organizational mechanism construction, there is a phenomenon of separation between digital construction and education and teaching departments within colleges and universities, and it is impossible to form an effective collaborative effort to cultivate digital literacy and educate people.

3.4. Students' ability foundation and development are uneven, and their motivation for independent improvement and ability to transform into practice are insufficient

As far as the current status of digital literacy cultivation among college students in my country is concerned, there are significant shortcomings in core competency dimensions such as digital content creation, career-related digital abilities, and digital innovation applications. Objectively speaking, there are obvious gaps in digital literacy among students with different academic levels, major types, and family backgrounds. Engineering and science students have a relatively good digital literacy foundation, while humanities, social sciences, and art students have a relatively weak digital literacy foundation^[7]. Students from rural areas and economically underdeveloped areas face the problem of unequal digital education opportunities, exacerbating uneven development. Subjectively, students generally have a “passive acceptance” mentality, have little awareness of actively learning digital technologies, participating in digital practices, and improving digital thinking, and cannot identify critical information or develop awareness of lifelong digital learning. Especially in the practical application of digital technologies, students' digital skills mostly stay in daily social interaction, entertainment, and basic office work, lacking in-depth use combined with professional skills. There are shortcomings in digital competitiveness and job competency.

4. Practical approaches to cultivate college students' digital literacy

4.1. Guided by concept iteration and top-level design, build a full-cycle systematic cultivation system

Colleges and universities should be based on the strategic needs of building Digital China and complete the concept upgrade from instrumental skills training to integrated cultivation of digital survival, digital innovation, and digital governance. In terms of teaching system design, colleges and universities must incorporate digital literacy into the core system of talent training, complete top-level design and goal reconstruction, formulate a stepped training plan that runs through the entire academic system for undergraduate and postgraduate students, and clarify the focus of cultivating digital knowledge, digital thinking, and digital responsibility at different academic stages. In terms of evaluation mechanism design, colleges and universities should closely align with the national digital literacy framework and industry standards, establish a multi-evaluation mechanism that includes digital skills, innovative applications, ethical norms, and practical transformation, use standardized evaluation to guide the direction of cultivation, and solve the problem of ambiguous educational orientation. In terms of integration mechanism design, we closely follow the development direction of education digitalization and deeply integrate digital literacy cultivation with professional education, ideological and political education, and innovation and entrepreneurship education to form a full-cycle, integrated education pattern of “value guidance-ability shaping-practical empowerment” to provide talent support with good digital capabilities for the construction of Digital China.

4.2. With curriculum reconstruction and content innovation as the core, create a hierarchical and classified adaptive teaching system

Colleges and universities need to break through the limitations of traditional information literacy courses and build a progressive and interdisciplinary integrated digital literacy course system. At the basic level,

general courses are offered to all students, covering the basic knowledge of new technologies such as big data, artificial intelligence, and generative AI, and filling in the gaps in theoretical knowledge such as digital ethics, data security, and network rule of law. At the professional level, promote the in-depth integration of digital technology with various majors, develop “professional + digital” special courses, strengthen the application of digital tools in professional learning scenarios, and focus on solving the problem of the disconnect between students’ digital abilities and professional needs. At the innovation level, high-level courses such as digital creation, digital intelligence innovation, and digital governance are offered to cultivate students’ digital innovation and integrated application capabilities. In terms of teaching methods, colleges and universities must reduce single classroom lectures and increase personalized teaching methods such as digital platforms, virtual simulations, and “immersive” training. Rely on university libraries and online learning platforms to expand teaching scenarios, integrate competition education, technological innovation, and case teaching into courses, connect the “first classroom” and the “second classroom”, achieve accurate integration of teaching content with new technologies, new scenarios, and new professional needs in digital China, and improve the effectiveness of training professional comprehensive talents.

4.3. Supported by resource integration and collaborative education, enhance all-round collaborative support capabilities

Colleges and universities should continue to tap resources inside and outside the school, build a three-dimensional cultivation platform with software and hardware support, teacher guarantee, and multi-party collaboration to solve the practical dilemma of cultivating digital literacy for college students. In terms of condition guarantee, colleges and universities must speed up the construction of environmental conditions such as intelligent laboratories, virtual simulation training bases, and big data training. Carry out systematic training on cutting-edge technology and teaching capabilities, form an interdisciplinary teaching team, and improve teachers’ digital teaching and practical guidance levels. In terms of organizational support, a working mechanism for collaborative education between education and teaching units, information construction units, student management units, libraries, and other relevant functional units has been established to form a joint force in education and training. At the same time, colleges and universities should continue to deepen the integration of industry and education, link up schools, schools and enterprises to build practical teaching bases, introduce practical projects and career scenarios, and allow students to complete skill transformation in digital practice. Focus on deeply integrating the cultivation of digital literacy among college students with grassroots employment, social services, and industrial innovation.

4.4. Taking kinetic energy catalysis and development as the starting point to stimulate students to improve and practice application efficiency independently

Colleges and universities need to change the cultivation model of students’ passive acceptance, focus on stimulating students’ internal driving force, and promote the transformation of digital literacy from daily application to ability expansion. Colleges and universities should vigorously promote students to actively learn digital technologies and participate in digital creation through digital practice projects, subject competitions, and innovation and entrepreneurship activities. Colleges and universities should build professional digital practice platforms to encourage students to apply digital skills to fields and scenarios such as professional research, social research, and volunteer services. At the same time, colleges and universities should strengthen digital ethics and normative education to improve students’ online behavior

self-discipline, information screening and other network security capabilities. Pay attention to preventing risks such as Internet addiction and information misrepresentation, and cultivate digital citizens with a sense of information responsibility.

“Scientific and technological innovation relies on talents, and talent cultivation relies on education. Education, technology, and talents are intrinsically consistent and mutually supportive.” In the context of the digital age, colleges and universities urgently need to address the main difficulties and problems that arise in the current talent training process, and take multiple measures to promote the transformation of digital literacy from skill empowerment to thinking empowerment and innovation empowerment, and ultimately achieve the coordinated improvement of college students’ digital literacy, employability, and professional development, and provide high-quality compound talents for the development of the digital economy and the advancement of the national digital strategy.

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