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The Value, Reality, and Practical Pathways for Enhancing Digital Literacy among University Students in the Era of Digital Intelligence

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Abstract

Enhancing digital literacy among university students is essential for building a digitally strong nation, increasing international competitiveness, bridging the digital divide, and promoting educational equity. It is also crucial for improving overall competencies and fostering comprehensive personal development. Currently, there are challenges in enhancing digital literacy among university students, including low awareness of digital security, weak digital innovation capabilities, and insufficient digital application skills. Improving digital literacy requires the collaborative efforts of government, higher education institutions, and individuals to create a supportive environment for its advancement.

Keywords: Digital Literacy; University Students' Digital Literacy; Value; Practical Pathways

With the accelerated innovation of disruptive technologies such as 5G, big data, artificial intelligence, cloud computing and regional chain, digital technology is profoundly affecting people's way of thinking, learning, work and daily life, which puts higher requirements on people's ability to recognize, understand and master digital technology, and the concept of digital literacy comes into being. In recent years, Chinese leaders have attached great importance to citizens' digital literacy and skills upgrading. As the future builders and successors of the country, the digital literacy of college students is related to the development of the future national economic lifeline and the international information competition advantage

With the establishment of the status, it has become a general trend to improve college students' digital literacy. Based on this, this paper starts with clarifying the concept of digital literacy, clarifying The Times value of the digital literacy improvement of college students in the digital intelligence era, deeply analyzing the practical problems of the digital literacy improvement of college students in China, and putting forward the optimization path of the digital literacy improvement of college students on this basis, which has important practical significance.

1|Analysis of digital literacy connotation

Digital literacy, as a cutting-edge emerging topic, has received much attention internationally, but it has not yet formed a unified and clear definition. The concept of digital literacy was first proposed by Israeli scholar Al Karai in 1994, and he constructed a framework of five elements of digital literacy, including image-image literacy, re-creation literacy, branch literacy, information literacy, and social-emotional literacy [1]. In 1997, American librarian Paul Gilster formally defined the concept in his book Digital Literacy, arguing that digital literacy is "the ability to understand and use digital technology to access and information [2]." With the rapid development of digital technology, the research of digital literacy is gradually deepening. In 2012, the American Library Association (ALA) recognized that "digital literacy is the ability to use information and communication technologies to retrieve, understand, evaluate, create, and communicate information, a process that requires technical and cognitive skills [3]." In 2022, the European Union developed an updated Digital literacy framework (DigComp2.2), which defines digital literacy as "the ability to use digital technologies confidently, critically and responsibly in learning, work and social participation [4]."

China's research on digital literacy started relatively late. It was not until 2006 that scholar Wang Xiaohui first put forward the concept of digital literacy in his article "Revolution and Conflict: Pedagogical Reflections on Education Informatization", which believed that digital literacy refers to "acquiring all exquisite abilities in all aspects of workplace and social life [5]." After that, domestic scholars studied the connotation of digital literacy from different perspectives. In 2012, Shi Ge argued that "digital literacy is people's ability and attitude to identify, understand, create, communicate, criticize information and solve problems by appropriate digital means in work, study, leisure and social participation [6]." In 2013, Wang Youmei et al. argued that "digital literacy is a comprehensive, dynamic and open concept formed through the development stages of media literacy, computer literacy, information literacy and network literacy [7]." In 2017, Xu Huan et al. argued that "digital literacy is an interdisciplinary literacy covering multiple fields such as natural science, social science and humanities [8]."

In general, although different scholars and institutions interpret the concept of digital literacy from different perspectives, they all emphasize that its connotation extends from various explicit operational skills and application abilities to internal digital qualities such as cognition, thinking consciousness and emotional attitude required by individuals to cope with complex social

environments. In 2021, Cyberspace Affairs Commission of the CPC Central Committee issued the Outline of Improving Digital Literacy and Action Skills for All People, pointing out that "digital literacy and skills are a collection of a series of qualities and abilities that citizens in digital society should possess in their learning, work and life, such as digital acquisition, production, use, evaluation, interaction, sharing, innovation, security, ethics and so on [9]." This interpretation is the most comprehensive and clear definition of digital literacy in China. It can be seen that, as some scholars have pointed out, "Digital literacy is a multi-faceted concept, involving the complex integration of technical skills, cognitive skills and metacognitive processes, as well as civic participation and moral awareness [10]."

2 | The value implication of the improvement of college students' digital literacy in the era of digital intelligence

In the era of digital intelligence, cultivating professionals with high levels of digital literacy is not only to meet the demand for talents in the digital transformation of society, but also a strategic choice for the reform and development of China's education, which is of great significance to building a digital power and enhancing international competitiveness, bridging the digital divide and promoting educational equity, improving comprehensive quality and promoting the all-round development of people.

(1) Building a digital power and enhancing international competitiveness

The Program for Improving the Digital Literacy and Action Skills of the whole People points out that it is necessary to improve the digital literacy and skills of the whole people as a basic, strategic and guiding work in building a cyber power and a digital China. In the development of social productive forces, workers have always been the most critical factor, the development of various undertakings in the country is inseparable from talents, and the construction of network power needs a large number of talents to meet the needs of the digital age. As of June 2023, according to the 52nd Statistical Report on the Development of Internet in China released by China Internet Network Information Center [11], the number of Internet users in China has reached 1.079 billion, and the Internet penetration rate has reached 76.4%. At present, the competition of comprehensive national strength in the world is reflected in whether a country has mastered more core technologies. The breakthrough and innovation of core technologies need the support of digital talents. To this end, training college students with a high degree of digital literacy is helpful to provide talent support for the construction of a network power, and provide a strong digital power support and a solid human resource foundation for China to open the comprehensive construction of a modern socialist country.

(2) Key measures to narrow the digital divide and promote equity in education

While digital technology brings convenience to people's life, work and study, the problem of social digital divide also appears. The digital divide generally includes two basic types: access gap and use gap. The first digital divide, the access gap, emphasizes the availability of appropriate broadband technology and communication equipment, primarily the gap in physical access to information technology. At present, 99.9% of primary and secondary schools in China have achieved more than 100 Mbit/s bandwidth access, 98.7% of primary and secondary schools have multimedia classrooms, and the gap in network access and equipment configuration has been significantly improved [12]. The second kind of digital divide, the usage gap, emphasizes the differences in users' use of Internet technology and the differences that gradually evolve from the differences. At present, many college students still have many difficulties in rational use of digital resources, search for relevant materials, digital content creation, digital security protection and so on. The underlying reason for this phenomenon is the lack of digital literacy among college students, which does not allow them to cooperate in utilizing digital technologies and resources. Therefore, in the digital age, improving students' digital literacy has become the key to narrow the digital divide, promote educational equity and promote the all-round development of college students.

(3) The internal requirements for improving the comprehensive quality and promoting the all-round development of people

The Platform for Action points out that improving the digital literacy and skills of the whole people is a strategic task to meet the requirements of the digital age, improve the quality of the people and promote the all-round development of the people [9]. In the era of digital intelligence, to improve the digital literacy of college students, it is necessary to adhere to the correct ideology as the guidance, and train the builders and successors of the socialist cause with all-round development of morality, intelligence, physical fitness, the United States and labor required by the construction of digital China. Digital literacy, as an individual's comprehensive literacy, not only includes the ability to correctly recognize and obtain data information, but also the ability to use various digital tools to communicate and collaborate with others, and should also have critical thinking and innovation capabilities as well as the key ability to actively cope with the ethical risks of the digital society. Therefore, facing the future, adapting to the requirements of the development of the digital era, and accelerating the improvement of college students' digital literacy is not only an internal requirement for improving the comprehensive quality and promoting the all-round development of people, but also a need for cultivating new people who can meet the needs of national rejuvenation in the new era.

3 | Analysis on the improvement of college students' digital literacy in the age of digital intelligence

As the main body of college students to realize the Chinese modernization and the great rejuvenation of the Chinese nation, its cultivation and promotion for the individual, the society

and even the development of the country and the nation have immeasurable practical significance. At present, college students have further improved their digital acquisition communication ability and digital ethics awareness, but there are also problems such as low digital security awareness, weak digital innovation ability, and insufficient digital application ability.

(1) Low awareness of digital security

Digital security awareness is the awareness of network security that college students possess in the process of digital technology application. They pay attention to data maintenance, personal privacy and digital identity protection, and have risk awareness of online rumors, telecom fraud and information theft. With the popularization of digital technology, the number of digital security problems involving college students is increasing. In Wang Yulong's survey, there is a problem of low awareness of network information security among college students. 46.2% of college students lack careful thinking when filling in personal information such as name, ID card number, student ID card information and home address on online platforms [13]. This can easily lead to personal identity information being exposed, and even being used by criminals, which leads to the occurrence of online fraud cases. In terms of preventing risks in the digital environment, more than 40% of college students lack safety thinking about browsing websites or network links, and randomly click on the mail in the mailbox, lacking the awareness of preventing risks in the network environment. In terms of the copyright of quoted information content, 26.6% of college students often indicate the source when quoting others' articles on the Internet, indicating that the awareness of academic rules needs to be strengthened. In addition, college students' self-discipline in the digital world also needs to be strengthened, and only 40.8 percent of college students often actively resist bad information in cyberspace. College students need to enhance their awareness of digital security and further strengthen their sense of moral responsibility and social responsibility.

(2) Weak ability of digital innovation

Digital innovation capability refers to the ability to modify, integrate, refine and recreate existing resources by using digital technology. College students should actively make use of abundant digital resources, extensive digital tools and ubiquitous digital platforms in their daily study and life to explore and innovate, which will effectively promote the development of college students' own thinking ability and embody their own value. Although the current college students can use some digital devices and software to simply produce and process text, pictures, videos, etc., there are still some difficulties in the in-depth and effective processing and sorting of digital resources, as well as the use of digital resources for content output and expression. In Li Zuoyan's research, 6.45% of college students think that they are not good at using digital resources for innovation, and 37.16% of students also think that they are not good at using digital resources for innovation, indicating that nearly half of college students have difficulties in exporting, expressing and innovating digital resources [14]. In terms of digital resource innovation awareness, only 6.92% of college students think that they have a very strong sense of digital resource innovation, and most other students have a weak sense of digital resource innovation. According to the survey

data, current college students' digital innovation ability is weak, which also reflects that their problem-solving ability and critical thinking need to be improved.

(3) Lack of digital application ability

Digital application ability refers to the ability of college students to use digital information to solve practical problems on the basis of obtaining and sorting out digital information, emphasizing the ability of college students to use digital technology to analyze and solve problems, and emphasizing the use of digital means to solve problems encountered in life, study and work. At present, as college students' daily learning and communication become more frequent, various digital resources and digital platforms need to be used frequently. The vast majority of college students can easily communicate with others on the Internet, cooperate with each other to complete some tasks, also can use different databases to find the required learning materials, use Baidu, Google and other different search engines to find useful information for themselves. However, in the application of digital intelligence technology, most college students still cannot make full use of information technology tools such as computer Internet, data analysis and multimedia to transmit and evaluate information, and cannot solve practical problems by integrating information knowledge. The same survey by Li Zuoyan found that more than 60 percent of college students felt they could not use the information they received well to solve practical problems. It reflects that the current college students are weak in solving practical problems with digital information, and their application ability is not strong, and it is difficult to effectively apply the obtained digital resources and information to practical problems.

4 | Effective ways to improve college students' digital literacy in the era of digital intelligence

The promotion of digital literacy of college students should advocate the principle of combining coordinated development and independent development, which requires the support of the government to form macro policies and the publicity and advocacy of literacy, as well as the professional teaching of college students and the organic connection between teachers and students.

(1)Strengthening government guidance and giving full play to the policy-making function

In the process of improving college students' digital literacy, the government subsystem should give full play to the function of policy formulation, and form an all-round and multi-level policy support system by formulating macro policy framework, improving the system of regulations and standards, increasing financial investment, and promoting the deep integration of industry, university and research. First, formulate a macro policy framework. The government should first clarify the overall goal and specific indicators of improving college students' digital literacy, and formulate relevant policies based on this. For example, it can be set to a certain point in time, the

level of digital skills that college students should have or the rate of digital literacy improvement. Second, improve the system of regulations and standards. The government should formulate or amend relevant laws and regulations to provide legal guarantee for improving college students' digital literacy. For example, regulations on data security and personal information protection can be introduced to regulate the behavior of college students when using digital technology. The government also needs to take the lead in formulating standards and norms for college students' digital literacy, clarifying the requirements and evaluation criteria for digital skills that students at different stages should possess, so that universities and educational institutions can carry out targeted teaching. Third, increase financial input. The government should increase the funding input for the digital construction of higher education, support universities to improve the digital teaching conditions, and enhance the digital teaching ability of teachers. The government can also set up special funds to support research projects, practical activities, innovation and entrepreneurship related to the improvement of digital literacy of college students. Finally, we will promote the deep integration of industry, university, research and application. The government can introduce preferential policies to encourage enterprises to participate in the digital education reform of colleges and universities. Through school-enterprise cooperation, the government can build a cooperation platform for production, university and research to jointly promote the improvement of digital literacy of college students.

(2) Improve school teaching and give full play to the function of talent training

Colleges and universities should play the main role in improving college students' digital literacy, and effectively improve students' digital literacy by optimizing curriculum, providing digital teaching resources, encouraging practice and innovation, and strengthening teacher training. First, optimize the curriculum and teaching content. Strengthen the provision of basic courses, especially those related to digital technology, such as computer basics, information technology, etc., to ensure that students master basic digital technology knowledge and skills. At the same time, according to the needs of each major, professional courses closely related to digital technology are set up to help students master specific technical operations. Second, provide digital teaching resources and platforms. Colleges and universities need to build digital education platforms, provide online courses, learning resources and experimental environments, etc., so that students can learn digital technology knowledge anytime and anywhere. Third, encourage practice and innovation. Actively encourage students to participate in digital innovation projects, such as scientific research projects, entrepreneurial projects, etc., to improve the application level of digital technology through practical operations. Fourth, strengthen teacher training and team building. The level of digital literacy, teaching ability and digital service penetration of university teachers and library subject service personnel will have a great impact on the level of digital literacy of university students. Librarians play an important role in the digital library, they are the managers of digital resources, responsible for integrating, classifying and updating large amounts of digital information. In the digital era, librarians need to have a sense of innovation and service

awareness, and constantly explore new service models, such as carrying out online consultation, establishing digital resource sharing platforms, etc., to meet the increasingly diverse needs of students.

(3) Adhere to independent learning and actively exert the active function of the subject

In the process of improving digital literacy, college students should give full play to the active function of the subject, and constantly improve their digital literacy level to meet the development needs of the digital age through proactive learning and practice, organizing and participating in educational activities, cultivating the ability of information screening and evaluation, strengthening the awareness and behavior of information security and other efforts. First of all, take the initiative to learn and practice. College students should strengthen the basic study of computer, and master the basic operation of computer, the use of common software and the knowledge of network security through elective computer courses or relevant training. At the same time, we make use of online resources to study independently, search for learning materials and video tutorials related to digital literacy through Internet search engines, and understand the latest development trends and technology applications in the digital age. Then, organize and participate in digital literacy education activities. Through digital technology lectures and workshops, students share their learning and practical experience, and exchange ways of thinking and tool applications in the digital age. In addition, participate in digital literacy training courses to deeply understand the cutting-edge knowledge and application scenarios of digital technology, and improve the application ability of digital technology. Secondly, cultivate the ability of information screening and evaluation. College students need to learn the basic methods and skills of information retrieval, understand the ways and tools of information acquisition, strengthen the assessment of the authenticity, accuracy and authority of information, and improve the efficiency of information acquisition. Finally, strengthen information security awareness and behavior. College students should pay attention to the protection of personal privacy, do not disclose personal information at will, pay attention to the identification of phishing, malware and other security risks, to ensure the security and stability of the network environment.

5|Conclusion

Improving college students' digital literacy is not only to keep up with the pace of the digital age, but also to cultivate their innovative thinking and problem-solving ability. With the rapid development of science and technology, digital skills have become the essential core quality of contemporary college students. By increasing digital literacy, college students will be able to better understand, analyze, and apply digital technologies to achieve greater success in their academic, professional, and personal lives.

References

[1] Xiao Junhong. Digital Literacy. China Distance Education, 2006, (05): 32-33.

[2]Paul Gilster, Digital Literacy, New York: Wiley, 1997, pp.25-48.

[3] Ye LAN. Progress and Enlightenment of digital literacy practice in Europe and America [J]. Library Construction, 2014, (07): 17-22.

[4] Cheng Huiping, Jiang Xing. Research on the path of citizens' Digital literacy improvement: A comparison and analysis based on the Digital literacy framework of the European Union and UNESCO [J]. Library science research, 2023 (01) : 54-60, DOI: 10.15941 / j.carol carroll nki issn1001-0424.2023.01.008.

[5] Wang Xiaohui. Revolution and Conflict: Pedagogical thoughts on education Informatization. China Audio-Visual Education,2006,(02): 9-12.

[6] Shi Ge. The connotation, composition and training Approach of Primary and secondary School Students' Digital Literacy [J]. Curriculum. Teaching methods, materials, 2016, 36 (7) : 69-75. The DOI: 10.19877 / j.carol carroll nki KCJCJF. 2016.07.011.

[7] Wang Youmei, Yang Xiaolan, Hu Wei, et al. From Digital Literacy to digital Competence: Conceptual evolution, Constitutive elements and integration model [J]. Journal of Distance Education,2013,31(03):24-29. DOI:10.15881/j.cnki.cn33-1304/g4.2013.03.004.

[8] Xu Huan, Shang Wenyi. A review on the development of digital literacy training models in the United States, Europe, Japan and China [J]. Library and Information Services, 2017, 61 (16): 98-106. (in Chinese) DOI:10.13266/j.issn.0252-3116.2017.16.014.

[9] Cyberspace Affairs Commission of the CPC Central Committee. Platform for Action to enhance Digital Literacy and skills for All [EB/OL]. [2024-04-12]. http://www.cac.gov.cn/2021-11/05/c_1637708867754305.htm.

[10]Park G.Digital technologies in higher education:Sweeping expectation and actual effects[J].International Journal of E-Learning & Distance Education,2011,25(03):1-2.

[11] China Internet network information center (2021). The China Internet network development state statistic report. http://www.cnnic.net.cn/.

[12] Ling Zhengqiang. College students in our country present situation, problems and digital literacy education path [J]. Journal of theory and practice of intelligence, 2020 lancet (07) : 43-47 + 53. DOI: 10.16353 / j.carol carroll nki. 1000-7490.2020.07.008.

[13] Wang Yulong. Realistic representation and optimization of network information literacy of post-00s college students: An empirical investigation based on four dimensions [J]. Cultural soft power, 2021, 6 (01) : 62-68. The DOI: 10.19377 / j.carol carroll nki/g0.2021.01.010. 43-1531.

[14] Li Zuoyan. Research [D]. Digital literacy cultivation to university students from nanchang university, 2023. The DOI: 10.27232 /, dc nki. Gnchu. 2023.003533.