

Digital Literacy Education in the United States: Current Status and Implications (Postprint)

Authors: Zhang Juan

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Abstract

[Objective/Significance] By reviewing the current development status of digital literacy in the United States, this study prompts reflections on digital literacy education in China and proposes corresponding countermeasures and recommendations. [Method/Process] Through comprehensive elaboration on U.S. digital literacy websites, educational resources, government legislation, and industry initiatives, it is revealed that American digital literacy education exhibits socialized and universal characteristics under the strong support of government departments, the formulation of action plans by industry associations, and various libraries each fulfilling their respective functions. Its educational methods are digitalized and open, while simultaneously emphasizing equitable access, privacy protection, and data security. [Result/Conclusion] The study proposes that China's education departments and library community should keep pace with the rapid development of the internet industry, formulate frameworks, standards, and long-term action plans for digital literacy education, and call for government support to play a key role in digital literacy education and comprehensively advance citizens' digital literacy.

Full Text

Preamble

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Current Situation and Implications of Digital Literacy Education in the United States

Wuchang Institute of Technology Library, Wuhan 430065

Abstract

[Purpose/Significance] By reviewing the current development status of digital literacy in the United States, this paper aims to stimulate reflection on digital literacy education in China and propose corresponding strategies and suggestions. **[Method/Process]** Through a comprehensive analysis of American digital literacy websites, educational resources, government legislation, and industry projects, this study reveals that U.S. digital literacy education exhibits socialized and universalized characteristics, supported by strong government departments, action plans formulated by industry associations, and various libraries performing their respective functions. The educational methods are digital and open, emphasizing equitable access, privacy protection, and data security. **[Result/Conclusion]** China's education departments and library communities should keep pace with the rapid development of the Internet industry, formulate frameworks, standards, and long-term action plans for digital literacy education, and call for government support to play a key role in advancing citizens' digital literacy comprehensively.

Keywords: digital literacy; digital literacy education; digital citizenship; equitable access; media literacy

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Introduction

In today's digital era, people's learning, lifestyles, thinking patterns, and behavioral models are all profoundly influenced. Understanding and mastering digital technologies has become a new form of literacy—digital literacy—which creates a “knowledge gap” between individuals by transforming learning efficiency and problem-solving capabilities. An increasing number of countries have recognized the importance of digital literacy and begun promoting digital literacy education across governments, institutions, and schools. Concurrently, issues such as information overload and personal data security have become increasingly prominent, further driving the expansion of digital literacy education.

Through web surveys and literature research, this study conducted statistical analysis of domestic and international literature on digital literacy education, interpreting key documents and comparing foreign digital literacy education practices. Ye Lan [1] reviewed digital literacy development in Europe and the United States; Zhang Jing and Hui Yanyan [2] focused on practices in foreign universities; Lu Lu and Ning Haifeng [3] explored digital literacy education in foreign academic libraries; Li Chunhui [4] examined digital literacy education in UK university libraries; and Xu Huan and Shang Wenyi [5] conducted comparative reviews of digital literacy cultivation models in the United States, Europe, Japan, and China to identify patterns and characteristics that could enlighten China's digital literacy education. While these studies each have their emphases, this research attempts to provide a detailed analysis of the current state of digi-

tal literacy education in the United States, summarizing the latest developments with substantial data. Therefore, this study selected U.S. government agencies such as the United States Congress, the Institute of Museum and Library Services (IMLS), the Federal Communications Commission (FCC), the Department of Education (ED), industry associations including the International Society for Technology in Education (ISTE), the American Library Association (ALA), and the National Information Standards Organization (NISO), as well as various library and university websites for investigation. Based on extensive legislation, policies, and action plans, the study analyzed literature related to digital literacy (deadline: November 16, 2017) to summarize the landscape of U.S. digital literacy education and provide reference for China's digital literacy development in light of its current Internet development status.

2. The Concept of Digital Literacy

Digital literacy was first proposed by scholar P. Gilster in his 1997 monograph *Digital Literacy*, defined as the ability to search for information online, understand the meaning behind links, and possess critical thinking and integration capabilities [6]. Since then, with the development of information and communication technologies, the concept has been continuously reinterpreted and expanded. On August 18, 2017, the International Federation of Library Associations and Institutions (IFLA) issued the “IFLA Statement on Digital Literacy” (hereinafter referred to as “the Statement”) [7], defining digital literacy as the ability to harness the potential of digital tools. As a result-oriented definition, IFLA posits that being digitally literate means utilizing digital technologies efficiently, effectively, and rationally to meet information needs in personal, social, and professional domains.

The Statement further elaborates on the skills and understanding that digital literacy should encompass: (1) Basic skills such as computer operation, word processing, spreadsheet creation, searching, online banking, and using e-government functions; (2) Knowledge of network operations, including data processing (especially personal data), which entails awareness of cybersecurity and privacy risks and understanding how to maintain online security through proper operations; (3) Creative use of technology, such as blogging, editing entries, designing web pages, or coding, and innovating expression through multimedia tools to achieve personal fulfillment and professional opportunities; and (4) Non-technical elements including legal and ethical knowledge and global citizenship awareness, which require people to follow the same behavioral norms online and offline, respect human rights, and maintain an open mind toward linguistic, cultural, and religious differences.

Thus, digital literacy and its specific skills are clearly defined. The above definition demonstrates that digital literacy requires the creative application of digital skills while adhering to certain legal and ethical standards—not all digital activities related to digital devices fall within the scope of digital literacy. The Statement also emphasizes that digital literacy is a lifelong learning process,

and libraries play a key role in enhancing digital literacy for people of all ages, classes, and backgrounds. Libraries should provide appropriate digital devices and environments, various network interfaces and digital resources, and make cultivating readers' digital literacy one of their core services [10]. While libraries strive to practice this, national and local governments, universities, schools, and various economic sectors should work together to introduce policies and specific action plans to promote digital literacy, collaborating with professional librarians to achieve the basic literacy goals outlined in the United Nations 2030 Agenda for Sustainable Development.

3. Current Status of Digital Literacy Development in the United States

With advanced Internet technology and a mature electronic communications industry, the United States has achieved over 82% Internet coverage, with adult users spending an average of 5.6 hours daily on digital media, over three hours of which is on mobile devices, according to Mary Meeker's 2017 Internet Trends Report released on June 1, 2017 [11]. Against this strong technological backdrop, the U.S. government, educational institutions, industry associations, civil organizations, and enterprises attach great importance to digital literacy, forming a nationwide momentum for digital literacy education.

3.1 Official Support

3.1.1 Government Funding

U.S. libraries receive primary funding support from the federal government. The Institute of Museum and Library Services allocated \$180.9 million, \$182.9 million, and \$186.6 million for fiscal years 2015-2017 respectively to the Library Services and Technology Act (LSTA) [12], which funds technology skills training for diverse populations across different regions, cultures, and social backgrounds. The Department of Education provided \$25 million, \$27 million, and \$27 million for fiscal years 2015-2017 to the Innovative Approaches to Literacy (IAL) program [13], which targets school library construction in low-income areas.

3.1.2 Legal Protection

In December 2015, President Obama signed the Every Student Succeeds Act (ESSA), which provides new technology tools and training to school libraries nationwide, particularly in underserved areas, to enhance students' critical thinking and research skills [14]. That same year, the Fair Access to Science and Technology Research Act (FASTR) [15] was passed, followed by the Equal Access to Congressional Research Service Reports Act in March 2016 [16]. In 2017, amendments to the Freedom of Information Act (FOIA) and oversight implementation bills were submitted to the President.

3.1.3 Policy Plans

All types of U.S. libraries have benefited from the National Broadband Plan, enabling them to provide high-speed mobile communication and network services

to patrons. In June 2015, the federal government introduced open Internet policies to ensure that individuals, organizations, and enterprises can access information on open network platforms. In March 2017, the Federal Communications Commission took measures to prevent communication companies from reducing network services to low-income groups and to oversee public information collection and access through the National Technical Information Service [12].

3.2 Industry Association Action Plans

The Young Adult Library Services Association (YALSA), a division of the American Library Association, launched a three-year Future Ready plan in May 2016 to meet the special needs of libraries in remote and underserved areas for resource development and staff training, aiming to positively impact youth learning skills and career planning [17]. In December 2016, YALSA introduced a five-year national research agenda (2017-2021) on libraries, learning, and teens [18], envisioning a series of actions in five areas: library learning support, staff knowledge and skills training, equitable access, cultural influence and social equity, and community engagement to help youth learning and development. While YALSA had been committed since 2015 to helping children in impoverished areas access digital tools and professional training, the new plan focuses on digital technology platform construction and space renovation, emphasizing case-based learning and advocating for the use of information mapping to redefine library service concepts.

The American Library Association's *State of America's Libraries 2017* report emphasizes that digital literacy involves far more than simply downloading smartphone apps—it should include understanding fundamental principles and innovative application of skills. Consequently, ALA launched multiple nationwide programs in 2017 designed to stimulate curiosity through personalized experiences, establishing skill-building experiences that affect all aspects of learning and life through interactions between experts, scientists, astronauts, and the general public [12]. These programs include: Science Cafés featuring open discussions on scientific issues, exchange of learning habits, and establishment of scientific thinking; Thinking Money focusing on financial literacy through digital tool experiences to understand all things related to money; and NASA@ My Library: A Universe of Stories, which involves video conversations with astronauts on the International Space Station live-streamed to youth to facilitate learning about space science and cosmic mysteries, enhancing scientific literacy that impacts lifelong learning.

3.3 University and Research Institution Libraries

U.S. academic libraries—those in universities and research institutions—have long assumed research responsibilities in academic communication, digital outcomes, data curation, digital humanities, research visualization, and born-digital products. They are also expanding into new areas including bibliometrics, alt-

metrics, e-learning, user information solutions, and research data management [12].

Committed to positively impacting student learning and life achievement, many universities and research institutions have joined digital literacy cultivation programs, offering courses and establishing websites to provide online services. Examples are shown in .

3.4 Civil Organizations and Enterprises

Numerous U.S. civil organizations are active in digital literacy education. In 2017, 18 civil organizations jointly wrote to the Federal Communications Commission demanding government action on competition, technological innovation, freedom of speech, and equitable access [12]. This study's survey of U.S. websites focused on digital literacy revealed that, except for the first being government-hosted, all others are hosted by individuals, civil organizations, or enterprises, as shown in .

4. Characteristics of Digital Literacy Education in the United States

4.1 Socialization and Universalization of Digital Literacy Education

Supported by robust federal funding and guided by government policies and legislation, U.S. digital literacy education demonstrates socialized and universalized characteristics. Scholars have noted that youth do not have an absolute advantage in digital literacy; rather, it correlates with digital technology levels, resource accessibility, and awareness of digital literacy [25]. Therefore, U.S. digital literacy education targets not only students but society as a whole, particularly offering digital technology training and strengthening digital resource development for underserved areas, the elderly, and people with disabilities to enhance universal digital literacy.

Libraries serve as crucial bases for digital literacy education. According to 2016 ALA statistics, 3,793 specialized libraries and 9,082 public libraries nationwide helped improve patrons' digital literacy during their learning processes, with over 90% of U.S. public middle and high schools having school libraries, more than 70% of which are equipped with digital resources [26].

Educational departments' policies and initiatives also play vital roles. The International Society for Technology in Education's 2016 National Educational Technology Standards include "digital citizenship" as a specific standard in both teacher and student versions. Additionally, educational departments and enterprises have jointly introduced learning management systems in schools nationwide for online coursework, assignment submission, and examinations, as well as for teachers' online office work and instructional management. Data shows that 86% of faculty and 83% of students have managed or taken at least one

course through learning management systems, with 56% of students completing nearly all courses via these platforms [27].

Enterprise and civil organization participation continuously updates digital literacy education methods, enriches digital resources, and makes them more targeted and practical by integrating with vocational skills training.

4.2 Differentiated Roles and Focuses Among Library Types

The American Library Association classifies libraries into three types: academic libraries (university and research institution libraries), school libraries (primary and secondary school libraries), and public libraries, each performing distinct functions with different emphases in digital literacy education.

The Association of College and Research Libraries (ACRL) has 2017 research goals focused on how libraries can align and impact institutional effectiveness. In digital literacy education, academic libraries develop action projects to demonstrate their professional value, establish standards to regulate library community behavior, and propose new role transformations for librarians, focusing on training librarians in new digital skills and data security awareness and technology.

School libraries, in an environment of rapidly growing digital content, strive to ensure youth have sufficient ability and access to evaluate information resources across multiple media types, extending their influence to parents. They recognize that cyberbullying, digital footprints, and digital literacy affect “digital natives” and their “digital immigrant” parents equally [12]. Therefore, school libraries provide digital media platforms, calling on parents to become “media mentors” for their children, learning together to become “digital citizens.” School libraries continuously develop various programs to promote safe, effective, and more responsible behavioral outcomes for all family members in the online world.

Public libraries, in their digital literacy education efforts, focus on addressing the “knowledge gap” and “equitable access” issues. People from low-income families and impoverished, underserved areas may develop a “knowledge gap” with developed regions without access to the latest technologies and digital resources. Therefore, libraries have a responsibility to provide equitable information access while ensuring privacy protection. Simultaneously, libraries must emphasize social equity and cultural influence, creating a fair and unbiased learning space and environment for people through community engagement in planning, implementing, and evaluating programs and services [12].

4.3 Digital and Open Educational Methods

U.S. digital literacy education methods align with their purpose: improving the public’s technical ability to use digital resources, learning to use digital tools creatively, and emphasizing data security and privacy throughout this process. Consequently, digital literacy education fully embodies digital and open charac-

teristics. First, whether library homepages or websites developed by individuals, organizations, or enterprises emphasize platform construction, offering numerous freely accessible digital resources on specific-topic platforms that anyone can easily obtain. Second, various training programs primarily adopt visualized online course formats, allowing users to independently select, study, and take online examinations to earn credits and certifications. Finally, there is emphasis on operability and real-time communication, establishing learning groups, interest groups, and project groups in multiple forms for online and offline interaction with timely feedback and strong interactivity.

4.4 Emphasis on Equity, Privacy, and Data Security

Beyond skill enhancement, digital literacy includes non-technical elements such as improved understanding and shaping of cultural influence, social equity, data security, and privacy protection—these involve law, social ethics, network norms, and global citizenship awareness.

The American Library Association and the National Information Standards Organization have formulated effective strategies for personal data protection. In 2015, the Intellectual Freedom Committee established privacy guidelines for library e-book and digital content circulation, while the National Information Standards Organization formulated general privacy guidelines for user data in libraries, publications, and software systems [28]. Inter-industry consensus holds that user privacy should be protected not only in libraries but also through coordination across all social sectors.

In 2015, the American Library Association launched an authoritative campaign enabling users to set data encryption functions in email and online applications to protect data security [29], which contributed to the passage of two bills that same year: the Foreign Intelligence Surveillance Act (FISA) and the Electronic Communications Privacy Act (ECPA).

The 2016 National Educational Technology Standards include “digital citizenship” as a specific standard, requiring teachers to carefully review resources while providing positive online experiences for students, protecting students’ intellectual property rights and personal privacy, and fostering social responsibility. The standards require students to manage their virtual identities, fully understand the persistent nature of their actions in the virtual world, and know how to use data collection technologies to query online browsing traces regarding data security [30].

5. Reflections on Digital Literacy Education in China

5.1 Existing Foundations and Advantages

The concept of digital literacy emerged alongside information and communication technologies, and digital literacy education cannot be separated from

developed networks, advanced communication equipment, and rich online educational resources—these hardware facilities form the foundation for digital literacy education development. China’s information technology industry is developing rapidly, with mature technology and advanced networks providing a solid basis for digital literacy education.

5.1.1 Internet Technology as a Solid Hardware Foundation

China’s Internet development momentum is remarkable, leading the world in many aspects. Mary Meeker’s June 1, 2017 Internet Trends Report shows that China’s Internet users exceeded 700 million, with growth slowing to 12%, among whom 92.5% access the Internet via mobile devices, with average online time exceeding four hours daily and mobile Internet usage surpassing television [11]. In 2016, China surpassed the United States to become the world’s largest gaming market, while live streaming—integrating social, interactive, and broadcasting functions—drives user participation and monetization beyond games and television. In mobile applications, shared mobility accounts for 67% of the global market share, mobile payments expand Internet usage and monetization scenarios, and algorithm-based intelligent push and information flow advertising attract large numbers of users. The integration of multiple functions in mobile apps further increases user consumption time.

Evidently, China’s Internet development has made digital skill application an advantage for Chinese users, with leading digital platforms, advanced digital technologies, and developed mobile terminal applications. Particularly, the younger generation, growing up alongside Internet development, are true “digital natives” who skillfully use digital technologies, are well-versed in online knowledge, use multimedia tools for online communication, and even maintain multiple social accounts to meet diverse information needs.

5.1.2 Rich Online Educational Resources

Surveys of China’s online market reveal abundant digital educational resources in Chinese websites: various MOOC platforms, micro-learning websites, online schools and education platforms established by governments, universities, and departments, and digital science and technology museums and digital museums specifically for primary and secondary students. NetEase Open Courses offers programs related to “digital” and “digital technology” themes, including MIT’s “The Future of Digital Public Media,” Zhejiang University’s “Digital Survival,” Sun Yat-sen University’s “Digital City,” South China Normal University’s “Digital Learning,” Jinan University’s “Big Data for Smart Living” and “Microblogging—Micro-writing and Extensive Knowledge,” Anhui University’s “Contemporary Media Literacy,” Beijing Jiaotong University’s “Entering Digital Technology,” and Chongqing University of Posts and Telecommunications’ “Entering Digital Media Art.”

Media literacy resources related to digital literacy are also available online: Chinese websites include the China Youth Media Literacy Network and Qianlong New Media Literacy Academy, while WeChat public accounts feature platforms like “BNU Digital Literacy Training Camp,” “New Media Literacy,” “Media

Literacy Education,” “Media Literacy,” “EDU Media Literacy,” “Media Literacy Encyclopedia,” and “Shaanxi Media Literacy Research Center.” Weibo also hosts self-media accounts such as “Abo Media Literacy,” “New Media Literacy Academy,” “Media Literacy Network,” and “NENU Media Literacy.”

5.1.3 Systematic Information Literacy Education in Universities

In contrast, China’s digital literacy education in universities shows a trend toward integration with information literacy education [5]. Since the Ministry of Education issued the “Opinions on Offering Literature Retrieval and Utilization Courses in Higher Education Institutions” in 1984, universities have undergone over 30 years of information literacy education practice, demonstrating popularization, stratification, and systematization [2]. This accumulated experience in university information literacy education provides fertile ground for digital literacy education, which should first develop on this foundation.

Based on the university information literacy education framework, many institutions have increased the proportion of digital skills content and conducted bold experiments, some of which represent practical explorations in digital literacy education. Examples include combining online games with information retrieval instruction, developing virtual reality and plot-based adventure games for reader activities, introducing live streaming to freshman library orientation, sharing and evaluating online topics, organizing online learning group exchanges and competitions, and offering media literacy courses.

5.2 Shortcomings and Deficiencies

In summary, digital literacy requires the creative application of digital skills within certain legal and ethical frameworks—not all digital device-related activities belong to the scope of digital literacy. Therefore, extensive skill application and active online presence do not necessarily equate to possessing digital literacy. From an educational perspective, Chinese Internet users’ usage tends toward entertainment and consumption, with gaming, live streaming, video, and shopping occupying substantial resources. Legal and ethical issues, privacy protection, data security, intellectual property rights, and global citizenship awareness remain weak aspects of Chinese users’ digital literacy.

While online learning resources and communication software are abundant and complex, they lack systematic integration. There are no official websites, databases, or resource banks specifically named for digital literacy, few thematic digital literacy contents appear on university or library homepages, and digital literacy is rarely found in self-media or public accounts established by groups or individuals. Although some universities offer media literacy courses, they remain unsystematic due to their recent introduction.

Compared with university information literacy education that has begun integrating digital literacy content, no specialized digital literacy courses exist for primary and secondary students, with content only reflected in extracurricular activities. Digital skills training for adults and research on the “digital divide”

between different groups and regions require further investigation.

5.3 Development Ideas and Improvement Space

In today's rapidly developing information technology environment, an increasing number of national governments have included digital literacy in their national competency frameworks. The knowledge gap resulting from differences in digital literacy affects people's behavioral patterns and thinking modes, thereby impacting real life. Consequently, the demand for digital literacy education is urgent, with many national governments, information departments, education departments, library associations, schools, civil organizations, and enterprises joining the digital literacy education movement, forming a universal and socialized development trend.

China's information industry is developing rapidly, with high popularization of digital technology applications and rich accumulation of online digital resources. Therefore, education departments and library communities should align their concepts with the times and technological development, formulate digital literacy education frameworks and standards for different groups, and launch long-term action plans while calling for government support. This will enable them to play a key role in comprehensively advancing citizens' digital literacy and meet the demands of the era.

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Author: Zhang Juan (ORCID: 0000-0002-1719-2454), Librarian, Master's degree, E-mail: citizenzhangj@163.com.

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