MODEL CONSTRUCTION AND CULTIVATION PATH OF DIGITAL LITERACY OF CHINESE NEWSPAPER EDITORS

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Abstract:

In the context of digital development, improving the digital literacy of all people has become the foundation for the development of China's digital economy. The objective of this study is to develop a digital literacy model for Chinese newspaper editors and propose practical paths to improve digital literacy, thereby providing opportunities for them to enhance professional capabilities and promote the integrated development of the publishing industry in the digital age. This study is a concept paper which adopted a descriptive qualitative research method to analyze the necessity and urgency of improving the digital literacy of Chinese newspaper editors, summarized the global definition and framework of digital literacy, and constructed a digital literacy model for Chinese newspaper editors. It includes four dimensions: digital awareness, digital competence, digital practice, and digital development, presenting a progressive relationship. Based on this model, strategies for cultivating and improving the digital literacy of Chinese newspaper editors were proposed, including: cultivating digital awareness, improving digital competence, strengthening digital practice, and achieving digital development.

Introduction

China has now entered a new stage of "accelerating digital development and building a digital China". The digital literacy and skills of the whole people and society have become the social foundation for the development of China's digital economy (Xi, 2022), which points out the importance and necessity of improving the digital literacy of the whole people. Newspaper

publishing is an important part of the publishing industry. The digital literacy of newspaper editors affects the transformation of digital publishing and the construction of the digital literacy system of editors. A survey on the impact of smart media on traditional personnel showed that compound talents with both traditional thinking and artificial intelligence knowledge have become an significant talent demand (Qi et al., 2023). Therefore, it has become an essential professional quality for newspaper editors to improve their digital literacy on the basis of traditional professional literacy and have the digital ability to use various information systems proficiently.

At present, the research on digital literacy is mainly concentrated in the fields of education and business, while there are relatively few studies in the field of publishing. In addition, the existing literature are mainly involved journal publishing. There is still a big gap in newspapers. The work of traditional newspaper editors, such as topic planning, manuscript review, editing, layout design, proofreading, and distribution, no longer meets the requirements of the digital and integrated media era. It is necessary to further promote the theoretical development and practical innovation of editors' digital literacy. Therefore, reshaping and cultivating the professional qualities of editors has become a situation that newspaper publishing units must think about and face in the era of integrated media.

Newspaper Editors' Motivation to Improve Digital Literacy

The Era Requirements for the Integrated Development of Publishing

The rise of advanced digital technologies such as big data and artificial intelligence has promoted the integrated development of the publishing industry. Text generation forms represented by ChatGPT have a huge impact on the publishing industry in China. Therefore, editors need to make rapid adjustments to adapt to the development and changes in the digital age. In April 2022, China issued the "Implementation Opinions on Promoting the Deep Integration and Development of Publishing", which pointed out that it is necessary to strengthen the cultivation of talents in the theory and practice of integrated development in the publishing discipline. Therefore, in the context of the integrated development of paper media and various new media, "one specialty and multiple skills" publishing integrated development talents have become a urgent requirement in the digital age.

Digital transformation is both an opportunity and a challenge for newspapers. Newspaper editors need to adjust their work goals in a timely manner, improve digital literacy, innovate work content, learn and master digital skills in planning, editing, publishing and distribution, skillfully use various multimedia platforms, and understand the latest trends and technological developments in digital publishing, so as to better understand readers' needs and market trends, and adapt to the development of the publishing industry.

The Needs of Editors' Professional Development

With the rapid development of digital technology and the widespread application of intelligent technology, the work content and workflow of newspaper editors have undergone a series of changes. In terms of work content, first of all, editors are no longer limited to paper media, but also need to process electronic content through various information systems, such as logging in to the electronic newspaper content management information system to upload electronic newspapers, operating and managing WeChat public accounts and Douyin accounts, etc. Secondly, editors need to establish connections and communicate with readers and authors on

social platforms, understand their feedback and opinions, and make timely adjustments to manuscripts. Thirdly, editors need to pay attention to hot topics on social media and accurately understand readers' interests and needs in order to carry out content reform and innovation and better serve readers. This requires editors to master and use various digital tools and software such as electronic newspaper management information systems and social media platforms to adapt to work needs. In terms of workflow, since the distribution of newspapers has now expanded to various multimedia platforms, the linear production process has been changed to a network structure of diversified dissemination, and all links from knowledge production to dissemination can be completed online. Therefore, timely improving editors' technical literacy and technical ability, media literacy and media ability has become an important way to improve editors' digital literacy (Zhou et al., 2023).

Changes in Readers' Reading Needs

Currently, readers' reading needs have changed significantly, the main reasons are as follows. First, the popularity of digital reading methods. According to the 19th National Reading Survey Report released by China Academy of Press and Publication (CAPP, 2022), 77.4% of adult citizens in China have read on their mobile phones, 71.6% of adult citizens have read online, and the proportion of the population has been increasing year by year. Second, some readers read through e-readers and Pads (tablets). Second, the economic potential of the digital reading market. According to the "2022 China Digital Reading Report" released by China Audio-video and Digital Publishing Association (CADPA, 2023) , the overall revenue scale of China's digital reading market in 2022 was 46.352 billion, a year-on-year increase of 11.5%. The huge economic potential has attracted publishers to move closer to digital publishing and promoted the prosperity of the digital publishing industry. Third, the diversification of digital reading methods. With the continuous updating of various digital products, the scenarios of digital reading have become more diversified. The promotion of application software such as WeChat Reading, Palm Reading, Audiobooks, and Video Reading allows readers to realize convenient reading on mobile phones. Therefore, in this context, the dissemination model of newspapers has gradually shifted from a single to a diversified digital channel.

The Connotation of Digital Literacy

Definition of Digital Literacy

The concept of "digital literacy" was first proposed by Yoram Eshet-Alkalai, an Israeli scholar in the field of digital studies, who pointed out that digital literacy refered to "picture-image" literacy, re-creation literacy, branching literacy, information literacy, "social-emotional" literacy, etc. (Eshet, 2004). In early studies, digital literacy was used to refer to the ability to read and understand hypertext and multimedia texts (Bawden, 2001). The European Commission (EC) proposed that digital literacy was the ability to use information technology in learning, working, entertainment and social participation critically and innovatively (Alexander, 2016). In 2018, a comprehensive definition of digital literacy was given by the United Nations Educational, Scientific and Cultural Organization (UNESCO), which refered to the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship (Law, 2018). In recent studies, it was defined as the ability to understand and apply information in various formats from multiple sources presented through computers and Internet, and also involve the full set of cognitive thinking skills practiced by digital information consumers (Ng, et al., 2023).

"digital literacy" was first proposed in China in 2006 (Chen, 2023). In 2021, Office of the Central Cyberspace Affairs Commission issued the "Action Outline for Improving the Digital Literacy and Skills of All People", which made the definition of digital literacy and skills: "Digital literacy and skills are a collection of qualities and abilities such as digital acquisition, production, use, evaluation, interaction, sharing, innovation, security, ethics and morality that citizens in the digital society should have in their study, work and life (CCAC, 2021)." This definition is universal. On this basis, Zeng (2023) considered that digital literacy was mainly based on the perspective of ability, emphasizing citizens' ability to use digital technology and digital tools in a narrow sense, while it expanded the scope of vision and also includes citizens' responsibility and awareness in using digital technology in a broad sense. Some researchers have further defined the meaning of digital literacy according to professional fields. Jiao (2023) defines the digital literacy of journal editors as: the quality and ability of journal editors to use the digital skills to solve problems and improve their thinking effectively, which is a combination of multiple abilities. Based on the above discussion, the definition of digital literacy was summarized in the following table (Table 1). This study defines newspaper editor literacy as: a combination of the capabilities and qualities of newspaper editors to use digital tools and digital skills to solve problems and improve thinking effectively, which is a collection of multiple abilities.

Table 1: Literature Review on Definition of Digital Literacy

Definition of Digital Literacy	Source
The ability to read and understand hypertext and multimedia texts.	(Bawden, 2001)
A collection of picture-image" literacy, re-creation literacy, branching literacy, information literacy, "social-emotional" literacy, etc.	(Eshet, 2004)
The ability to use information technology in learning, working, entertainment and social participation critically and innovatively.	(Alexander, 2016)
the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship.	(Law, 2018)
A collection of qualities and abilities such as digital acquisition, production, use, evaluation, interaction, sharing, innovation, security, ethics and morality that citizens in the digital society should have in their study, work and life.	(CCAC, 2021)
The ability to understand and apply information in various formats from multiple sources presented through computers and Internet, and also involve the full set of cognitive thinking skills practiced by digital information consumers.	(Ng, et al., 2023)
Digital literacy is mainly based on the perspective of ability, emphasizing citizens' ability to use digital technology and digital tools in a narrow sense, while it expands the scope of vision and also includes citizens' responsibility and awareness in using digital technology in a broad sense.	(Zeng, 2023)
The quality and ability to use the digital skills to solve problems and improve their thinking effectively, which is a combination of multiple abilities.	(Jiao, 2023)

Digital Literacy Framework

Early studies focused digital literacy on digital capabilities. Martin and Grudziecki (2006) proposed a three-level model of digital literacy: the first level is general digital capabilities, including skills, methods, and attitudes; the second level is professional-level digital capability application, emphasizing the application of digital technology in certain disciplines or professional fields; the third level is digital capability innovation, that is, the capability to use digital technologies for reform and innovation. The construction of the digital literacy framework has also gradually attracted the attention of some international organizations and government departments. The more representative ones include the three-dimensional framework proposed by the New Media Alliance of United States, including general literacy, creative literacy, and literacy that runs through all disciplines (Alexander, 2016). Beside this, the Global Framework for Digital Literacy published by United Nations Education Scientific and Cultural Organization (UNESCO) constructs a digital literacy framework from seven domains, which were operation, information, content creation, communication, problem solving, ethics and safety, and occupation-related, which has become a framework with a wide range, high recognition, and universal application (Jiao, 2023). In addition, some researchers believe that digital literacy covers a person's comprehensive literacy, which includes not only basic computer literacy and media literacy, but also cultural literacy and disciplinary literacy (Tinmaz, 2022). As digital skills are valued in education, a digital literacy framework for future educators has been developed, including information literacy, computer literacy, media literacy, communication literacy, visual literacy, and technology literacy, which is conducive to narrow the digital skills gap for graduates (Reddy et al., 2023).

However, China started relatively late in the research on digital literacy. At present, a unified, systematic and complete theoretical system has not yet been formed. Based on the foreign digital literacy content framework, Zeng (2022) proposed a digital literacy "five forces" model based on epistemic logic, which included five dimensions: perception, integration, absorption, practice and development.

With the increasing number of studies on the digital literacy system in the Chinese academic field, many researchers have begun to try to build a research framework for specific groups. Wang, et al. (2021) proposed a digital literacy framework for primary and secondary school students, including three dimensions: awareness and cognition; adaptation and development; participation and interaction. Su (2021) proposed measurement indicators for farmers' digital literacy, namely digital general literacy, digital social literacy, digital creative literacy, digital specialized literacy and digital safety literacy. Hu and Sun (2021) constructed a digital literacy model for Chinese residents, which is divided into two first-level indicators: digital ability and digital awareness. In 2022, the Ministry of Education of China developed "Teacher Digital Literacy" as the industry standard for teachers and formulated a digital literacy framework, including five first-level indicators: digital awareness, digital technology knowledge and skills, digital application, digital social responsibility, and professional development (Ding, 2023).

Summarizing the above research achievements, it can be seen that the research on digital literacy shows diverse characteristics, the digital literacy framework have been proposed especially for specific groups such as primary and secondary school students, the elderly, farmers and other digitally disadvantaged groups, which provide a useful reference for improving the digital literacy of disadvantaged groups and bridging the digital divide. However, there is still a large research gap in the digital literacy of many groups such as newspaper editors.

Therefore, this study attempts to construct a digital literacy model for newspaper editors in the era of artificial intelligence.

Table 2: Literature Review on Digital Literacy Framework

| Digital Literacy Framework	Source
general digital capabilities, professional-level digital capability application, digital capability innovation	(Martin & Grudziecki, 2006)
general literacy, creative literacy, and literacy that runs through all disciplines	(Alexander, 2016)
media literacy, computer literacy, internet literacy, information and communication technology (ICT) literacy and information literacy	(Law, 2018)
awareness and cognition; adaptation and development; participation and interaction	(Wang et al., 2021)
digital general literacy, digital social literacy, digital creative literacy, digital specialized literacy and digital safety literacy	(Su, 2021)
digital ability, digital awareness	(Hu & Sun, 2021)
perception, integration, absorption, practice and development	(Zeng, 2022)
computer literacy, media literacy, cultural literacy and disciplinary literacy	(Tinmaz, 2022)
information literacy, computer literacy, media literacy, communication literacy, visual literacy, and technology literacy	(Reddy et al., 2023)
operation, information, content creation, communication, problem solving, ethics and safety, and occupation-related	(Jiao, 2023)
digital awareness, digital technology knowledge and skills, digital application, digital social responsibility, and professional development	(Ding, 2023)

Methodology

This study adopts descriptive qualitative research method. Qualitative research is a method for researchers to define and deal with problems. The specific purpose is to describe the specific characteristics, behaviors, motivations, etc. of the research subjects, using various natural methods to describe the phenomena experienced by the research subjects, and further explore the causes of their occurrence (Moleong, 2014). It obtains keen insights by exploring problems, understanding event phenomena, analyzing human behaviors and opinions, and answering questions. In short, qualitative research is a type of research that attempts to understand the phenomena experienced by the research subjects (Fauziah, 2023). This study focuses on understanding rather than quantification, and analyzes and obtains information on deep reactions through existing literature. This study chose Chinese newspaper editors based on the following considerations: their work processes and work content have undergone profound changes under the influence of digital technology, and their digital literacy plays an important role in the development of the entire national publishing industry and further affects the development of the entire country's digital economy.

Research Finding

Model Construction of Digital Literacy for Newspaper Editors

"Action Outline for Improving the Digital Literacy and Skills of All People" emphasizes that cultivating digital citizens with digital awareness, computational thinking, lifelong learning

ability and social responsibility must be focused (CCAC, 2021), which points out the importance of digital awareness for personal development in the digital and intelligent era (Cheng, 2021). Digital competence and digital practice are important indicators for building the editorial digital literacy system, and play a huge role in promoting the digital integration development of the publishing industry (Zhang & Liu, 2022; Zeng, 2023). In addition, in the "five forces" model of digital literacy by Jiang et al. (2022), development power was considered a dimension of digital literacy, while innovation power and development power were the ultimate goals of digital literacy. On the basis of the above discussion, this study proposed a digital literacy model for Chinese newspaper editors based on Chinese editorial work practices (Figure 1).

Digital Development (*innovation*)

Digital Practice (*key*)

Digital Competence (*core*)

Digital Awareness (*foundation*)
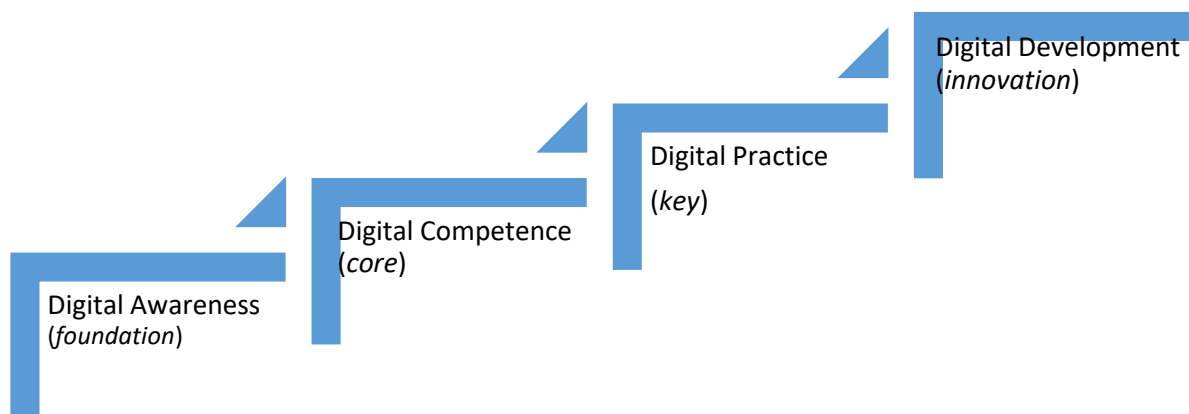
Figure 1: Digital Literacy Model of Chinese Newspaper Editors
Source: (Cheng, 2021; Zhang & Liu, 2022; Zeng, 2023; Jiang, et al., 2022)

Digital awareness refers to the understanding of the potential opportunities created by the use of new technologies such as the Internet (Akkoyunlu, 2011). It includes not only understanding the various risks on the Internet, but also using digital tools in research, communication and entertainment actively. Some researchers summarize it as the safe and responsible use of digital technology (Corradini & Nardelli, 2021; Vidal Ferré, 2022), which is related to the basic literacy skills of using digital tools such as smartphones, tablets, iPads and computers (Khanal, 2021). Digital competence refers to the ability of individuals or organizations to use digital technology and information and communication technology to obtain, process, analyze, innovate and apply information in the digital age. It is considered by the European Union to be one of the core competencies that people should have for lifelong learning (Wang, 2024). Digital practice refers to the process of carrying out actual operations and practical activities by using digital technologies and tools. Digital development is the process of using digital technologies and strategies to create new or improve existing products, services, processes and business models.

In the digital literacy model of Chinese newspaper editors, digital awareness is the foundation and premise of digital literacy, digital competence is the core of digital literacy, which is both technical support and guarantee, Digital practice is the key for editors to fully apply the theory and technology of digital competence to actual work, and digital development is innovation, which is the ultimate goal of editors' professional development. The four parts do not exist in

isolation, but penetrate and influence each other, presenting a progressive relationship in this model. Promoting the construction of the digital literacy with digital awareness, digital competence, digital practice, and digital development as the content framework will help expand the scope of editorial quality from traditional professional ability to the field of "professional ability + digital literacy", and further promote the expansion and innovation of editorial professional ability theory.

The Path of Cultivating Digital Literacy for Newspaper Editors

The cultivating and improving digital literacy of newspaper editors has an important impact on adapting to the digital media environment, improving editing efficiency, broadening reporting channels and improving newspaper quality. Editors need to adapt to the development trends of the media and become compound talents in the digital age in order to enhance their core competitiveness and better serve readers and authors.

Cultivating Digital Awareness

With the widespread application of new media technologies, the cultivation of digital awareness of newspaper editors has become one of the important tasks. The cultivating of editors' digital awareness is the basic premise and inherent requirement for improving the basic literacy of editors in the digital age (Du, 2023). The cultivation of editors' digital awareness includes three aspects: First, paying attention to digital trends. Editors should pay close attention to the latest development trends in the field of digitalization and understand the impact of digital development on editorial work. They can obtain new digital information by paying attention to digital development trends and participating in industry conferences. Second, following the development trends of the industry. Digital technology and tools are constantly developing and updating. The workflow and work content of the editing industry are also constantly developing and changing. Editors need to have the awareness of constantly updating digital knowledge and keep abreast of industry trends and the application of new technologies in order to maintain the communication influence of newspapers. Third, strengthening digital security awareness. Editors need to pay attention to protecting the information security of individuals and institutions in digital work and guard against risks such as cyber attacks and data leaks. They can improve digital security awareness by learning network security knowledge, backing up work data, and strengthening password management.

Improving Digital Competence

Only by constantly improving their digital competences can newspaper editors maintain their professional competitiveness in their career development. First, learning digital technology knowledge is the most important path to improve digital competences. Editors need to understand the connotation and application of digital technology, and can constantly update their digital technology knowledge by participating in relevant training courses and online learning. Second, they also need to master digital tools and software. Editors need to be proficient in using digital editing tools and software, such as e-newspaper production software, image processing software, data analysis tools, etc. Through actual operation and practical application, improve the efficiency and quality of editors' work. Third, enhancing digital dissemination and distribution capabilities is also an important way for editors to improve their digital competences. With the development trend of digitalization, various social media have become important channels for information dissemination. Newspaper editors should constantly learn social media operations and information dissemination skills to improve their digital communication capabilities, further improve digital competences.

Strengthening Digital Practices

It was pointed out that the essence of information system research is to master the design and use of information and communication technologies in the actual environment, and to critically reveal the practices that emerge after the application of digital technologies (Agerfalk, 2020). Therefore, when studying digital practice, we should not only focus on technology, but also study practical activities in a certain context.

Editors should always bear in mind the purpose of running a newspaper, apply digital knowledge and skills to work practice according to the actual work, and accurately serve authors and readers. In terms of content management, newspaper editors need to be proficient in using electronic newspaper management information systems, newspaper WeChat public accounts, Douyin accounts and other digital platforms to successfully complete content editing, uploading, management and maintenance. In terms of publishing process, editors need to master the digital publishing process, including electronic version typesetting design, editing, proofreading, distribution and other links. These processes are different from traditional publishing and require editors to be familiar with digital tools and software, as well as the technical requirements and specifications of digital publishing. In terms of content production, editors need to master the skills of multimedia content production, including image processing, audio production, video editing, etc. Diversified content presentation forms help improve readers' reading experience. In terms of publicity, first, editors should have user-thinking, meet the needs of users at different levels, attract and assist users in reading and research[25]; second, editors need to understand the strategies and techniques of social media and network promotion in order to carry out effective content promotion, and can also interact with readers through social media platforms, WeChat public accounts and other channels.

Promoting Digital Development

Newspaper editors should cultivate digital thinking and innovative awareness, and be good at discovering and using digital technology and data resources for innovation. The digital development of editors has the following cultivating paths.

First, continuing to pay attention to cutting-edge digital technologies, actively thinking about how to use digital innovation to solve practical problems, and having the courage to try and create new digital distribution channels. Second, actively participating in digital projects such as digital publishing, digital content creation, and digital marketing. Third, strengthening cross-industry cooperation and learning, newspaper editors can collaborate with experts and practitioners in other fields to jointly explore the latest developments and application cases of digital innovation.

By stimulating digital innovation, editors can broaden their horizons, gain more innovative inspiration and work experience, and enhance their digital innovation capabilities and industry influence in their career development.

Discussion

This model was developed for a specific group of people, newspaper editors, in the context of China's digitalization. It is also the first editor digital literacy model based on relevant government policies and academic literature (CCAC, 2021; Zhang & Liu, 2022; Zeng, 2023；Jiang et al.，2022). At the national level, it provides a useful reference for policymakers in the publishing industry and helps to formulate evaluation standards for newspaper editor digital

literacy. At the level of economic development, improving the digital literacy of each citizen has become an important factor in the development of the digital economy of the entire country (Xi, 2022). Researchers have recognized this urgent need and have discussed improving editor digital literacy and promoting the integrated development of the publishing industry in order to accelerate the cultivation of digital literacy of editors (Qi et al., 2023; Zhou et al., 2023). Therefore, this model supports and promotes China's citizen digital literacy improvement plan, which will be conducive to the improvement of professional capabilities.

The contribution of this study is that it enriches the theoretical research results of digital literacy and provides a chance for Chinese newspaper editors to improve their digital literacy, thereby providing them with opportunities to promote the integrated development of the publishing industry in the digital age. In summary, this study achieved the research objective. In order to develop the proposed model, this study conducted a literature review of the relevant policies of the Chinese government on digital literacy, the connotation and framework of digital literacy. However, the literature reviewed in this study is not exhaustive, because the number of literature related to digital literacy may be unlimited, whether it is academic literature published on database platforms or non-academic literature published by government departments on portal websites. The model we proposed is a conceptual model, which is mainly based on the main policy documents and academic literature that can be reviewed. In the next step, researchers need to construct detailed evaluation indicators based on this model, and further improve and verify it through expert feedback and respondent surveys.

Since this study adopted a descriptive qualitative research method, the model proposed maybe have some limitations. Based on this conceptual paper, further work is necessary to improve and verify the proposed model. It is also recommended that future research build a digital literacy indicator system for evaluation based on this model, verify the specific evaluation indicators of newspaper editors' digital literacy through empirical research, so as to improve the construction of the digital literacy system, and enrich the research results in this area. In addition, the region of this study was conducted in China, and the government's policy documents on citizens' digital literacy form a reference basis, which may lead to the fact that the application of the research results may not be extensive enough. In the future, researchers can also be free from geographical restrictions, making the research results universal.

Conclusion

This study adopted a descriptive qualitative research method, through the analysis of China's digital policy, the trend of digital development in publishing industry, and the changes in readers' reading needs in the digital era, it can be concluded that it is necessary and urgent to cultivate and promote the digital literacy of newspaper editors. This is an indispensable part of achieving digital literacy for all people and an inevitable requirement for the digital transformation of the publishing industry. At present, there is no systematic and highly recognized digital literacy framework in China. Although there are digital literacy frameworks for specific groups, such as farmers, teachers, and primary and secondary school students, there is no digital literacy framework or model for newspaper editors in China. In view of the importance of this issue, this study proposed a digital literacy model for Chinese newspaper editors according to the work content of Chinese newspaper editors, including four elements: digital awareness, digital competence, digital practice, and digital development. Among them, digital awareness is the foundation, digital ability is the core, digital practice is the key, and digital development is innovation. These four elements do not exist in isolation, but are

interconnected and mutually reinforcing, presenting a process of progressive layer by layer in this model. Based on this model, this study proposed that the paths to cultivate and improve the digital literacy of newspaper editors, including: (1) cultivating digital awareness; (2) improving digital competences; (3) strengthening digital practices; and (4) promoting digital development.

Acknowledgements

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