



RESEARCH ON THE PROBLEMS AND COUNTERMEASURES OF CULTIVATING CITIZENS' DIGITAL LITERACY IN THE DIGITAL ERA

Author's Name: Zhiyong Fang¹, Mengyan Lin², Jiawei Zhuge³

Affiliation:

Zhejiang University of Finance and Economics Dongfang College, Haining 314408, China

Corresponding Author Name and Email ID: Zhiyong Fang, 1021381208@qq.com

ABSTRACT

Digital literacy is the core literacy of citizens in the digital era, and the enhancement of citizens' digital literacy contributes to the in-depth development of digitalization in Hangzhou. By analyzing the current situation and problems of citizens' digital literacy, based on the original model and countermeasures, we propose strategies for improving citizens' digital literacy in the digital era from the perspectives of the government, citizens, and the society: coordinating the planning of resources and strengthening the top-level design; strengthening the construction of infrastructure and expanding the supply of high-quality digital resources; accelerating the improvement of the digital literacy cultivation system and strengthening the subject linkage effect; and adhering to a comprehensive approach to create a good digital ecosystem. The following are some of the key elements of the program. By coupling the strengths of the government, society and citizens, we will work together to improve digital literacy and further promote the digital construction and upgrading of the region.

Keywords: Digital Age; Digital Literacy; Strategic Recommendations

INTRODUCTION

Digital literacy is a new requirement for citizens in the digital era, and one of the necessary qualities for survival in the digital era[1] , Enhancing the digital literacy of the whole population is crucial to promoting the digital transformation of the economy and society and the development of the digital economy, and many countries have elevated the enhancement of the digital literacy of the whole population to a national strategy[2] . With the rapid development of the digital economy in China, the state attaches greater importance to digital literacy, and has introduced a series of policies to enhance the digital literacy of the entire population.2021 In October 2021, General Secretary Xi Jinping emphasized the need to enhance the digital literacy and skills of the entire population and the entire society in the collective study of the Political Bureau of the Central Committee, and in the same month, the Central Ministry of Internet Information Technology (MIIT) introduced the Outline of Action for the Enhancement of Digital Literacy and Skills for the Entire Population. For example, Hangzhou City, Zhejiang Province, responded to the national call to carry out the construction of digital literacy education experimental area and other measures, to a certain extent, to improve the digital literacy of the public, but Hangzhou citizens digital literacy enhancement still exists bottlenecks, the lack of top-level design, insufficient supply of resources, the cultivation system has not yet been formed, the digital environment is insufficient to protect to a greater extent to limit the Hangzhou citizens further enhancement of digital literacy, and at the same time delayed the Hangzhou's digital upgrading process, so it is urgent to explore the strategy of efficiently improving Hangzhou citizens' digital literacy, which is an important strategy to promote Hangzhou's digitalization process.

The current research on digital literacy for all people mainly focuses on the concept of digital literacy[3] , factors affecting the cultivation of digital literacy[4] , the necessity of enhancing digital literacy for all people[5] and the way of cultivating digital literacy[6] . Some scholars believe that digital literacy is the comprehensive ability of people to critically access, understand, communicate and integrate digital resources through digital technology, and to cultivate security awareness and cultural literacy[7-8] . Based on the current status of digital literacy of the whole population, some scholars have conducted in-depth analysis of the factors affecting digital literacy, and the phenomena of imperfect data sharing and collaboration mechanism, unsound digital training system, and lack of digital talents have hindered the enhancement of citizens' digital literacy to a greater extent.[9] In addition, the subjective and objective factors, such as the policy, digital awareness, infrastructure, digital resources, and the cultural environment, also affect the effect of the cultivation of digital literacy of the whole population. The effect of[10-11] . Enhancing the digital literacy of the whole population is the key to promoting digital transformation, helping to promote the innovative and sustainable development of the digital economy and narrowing the "digital divide"[12] .

THE CURRENT SITUATION AND EXISTING PROBLEMS OF HANGZHOU CITIZENS' DIGITAL LITERACY ENHANCEMENT IN THE DIGITAL ERA

Lack of top-level design

Enhancing the digital literacy of the entire population is a systematic project that must be based on the overall situation, with a good top-level design and systematic promotion. In order to enhance the digital literacy and skills of the entire population, China has issued the Outline of Action for Enhancing the Digital Literacy and Skills of the Entire Population, which points out the strategic direction of enhancing the digital literacy of the entire population, but the Outline has not made any specific strategic planning and deployment of actions to enhance the digital literacy of the entire population. In addition, although the Outline has basically done a good job in the top-level design of China's efforts to improve people's digital literacy, provinces and cities have not formulated top-level frameworks and strategic plans suitable for the local economic development, cultural background and quality of citizens, and it is still difficult for them to carry out all-around, all-level, and all-factor coordinated planning of the systematic project of improving people's digital literacy in light of their own strengths, which is detrimental to the realization of the goal of improving the people's digital literacy in a high-efficiency and high-quality manner. This is not conducive to realizing the goal of improving people's digital literacy in a highly efficient and high-quality manner.

Insufficient supply of quality digital resources

As a core elemental resource in the digital era, data elements are an important support for digital transformation, and the supply of high-quality digital resources plays a crucial role in enhancing the digital literacy of all people and promoting digital transformation. Digital infrastructure is the cornerstone of building a digital society, but also the basic guarantee for the supply of digital resources, the Central Politburo in 2020 proposed to accelerate the development of new infrastructure, General Secretary Xi also repeatedly emphasized the need to accelerate the construction of digital infrastructure during his visit to Zhejiang, but the construction of digital infrastructure is still inadequate. In addition to digital infrastructure, the discrete provision of digital resources, the mismatch between the supply and demand of digital resources, and the "high barriers" to the opening of digital resources are all important reasons why the public is unable to enjoy high-quality data resources. The public mainly obtains free data resources through the platform built by the government, but the construction of government digital platforms is not planned in a coordinated manner, and different regions, levels and departments work in their own ways, causing duplication of construction and resource crossover. At the same time, digital resources are scattered in various databases, the degree of sharing of digital resources is insufficient, and

the phenomenon of information islands still exists.

The training system is not yet in place

The improvement of digital literacy is a long-term, gradual and accumulative process, which cannot be separated from the support of a stable cultivation system. At the same time, because of the existence of individual differences and the different characteristics of different groups due to regional differences, age differences, cultural differences and so on, a targeted cultivation system should be formulated according to the unique characteristics of each group. Due to the limitations of physiological factors such as memory loss, language decay, and inattention, as well as psychological factors such as fear of learning new things, the learning ability of the elderly is generally weaker, and they have always been in a disadvantageous position in the digital age. In the "Outline of Action to Enhance the Digital Literacy and Skills of the Whole Population" issued by the Central Internet Information Committee, the need to cultivate and improve the digital literacy and skills of the elderly group is emphasized. For example, Hangzhou City has also announced the "Hangzhou "Silver Age Crossing the Digital Divide" Special Action for Popularization of Science (2021-2023) Work Program" in 2021, the main content of the program is that relevant departments should train the elderly in digital literacy and skills around their daily lives, in order to assist them in integrating into the digital age as soon as possible and crossing the digital divide, and it is expected that 350,000 people will be trained in the next three years.

Inadequate safeguards for the digital environment

Digital ecology covers digital cooperation, digital security and digital governance, and is an important support for promoting all-round and deep digital transformation of the society, and a good digital ecology provides a good external environment for governmental organizations, social organizations, business organizations and individuals to carry out all kinds of economic activities in the digital era, and creating a good digital ecology is a must for the development of the digital economy. In 2021, the "Outline of the Fourteenth Five-Year Plan and Visionary Goals for the National Economic and Social Development of the People's Republic of China" was officially released. Outline of the Fourteenth Five-Year Plan for National Economic and Social Development of the People's Republic of China and Vision 2035" was officially released, which mentions the need to accelerate the digital transformation and vigorously develop the digital economy, and focuses on the creation of a good digital ecology as an important guarantee for building a new advantage in the digital economy and building a digital society. However, at present, China's digital ecology is still in a state of disorder. Due to the lack of effective regulatory means, netizens have lost the constraints on their words and deeds in cyberspace, resulting in frequent occurrence of false information and rumors online, and various forms of online fraud are also

endless. Many small and medium-sized platforms force advertisements and applications, and even set up some consumption traps to lure consumers into over-consumption and jeopardize their interests. Because of the limitations of technical means, data security is also under greater threat, personal information, private data and so on are often leaked, and even the emergence of a gray industry chain of trafficking in personal information and private data. The serious disorder of the digital ecosystem has the factor of technical level, but the main reason is still about network security, data security, personal information protection and other aspects of the legal system and regulatory system is not sound, speed up the legislative process related to the digital economy, as soon as possible to create a good digital ecosystem has been imminent.

COUNTERMEASURES TO ENHANCE DIGITAL LITERACY OF HANGZHOU CITIZENS IN THE DIGITAL ERA

The wide dissemination of digital culture and the construction and application of digital technology have prompted HCM City to enter the digital era, and digital construction has upgraded and reshaped our society in all aspects at a rapid pace. Facing the profound changes in the digital era, cultivating citizens' ability to understand digital culture and apply digital technology, and improving the digital literacy of the whole population have prompted citizens to better adapt to the digital era. Aiming at the current situation and challenges of citizens' digital literacy enhancement in the digital era, this paper puts forward the enhancement strategies in four major aspects, namely, coordinating the planning of resources and strengthening the top-level design, strengthening the construction of infrastructure and expanding the supply of high-quality digital resources, accelerating the improvement of the digital literacy cultivation system and strengthening the linkage effect of the main body, and adhering to a comprehensive approach and creating a good digital ecology, as shown in Fig. 1.

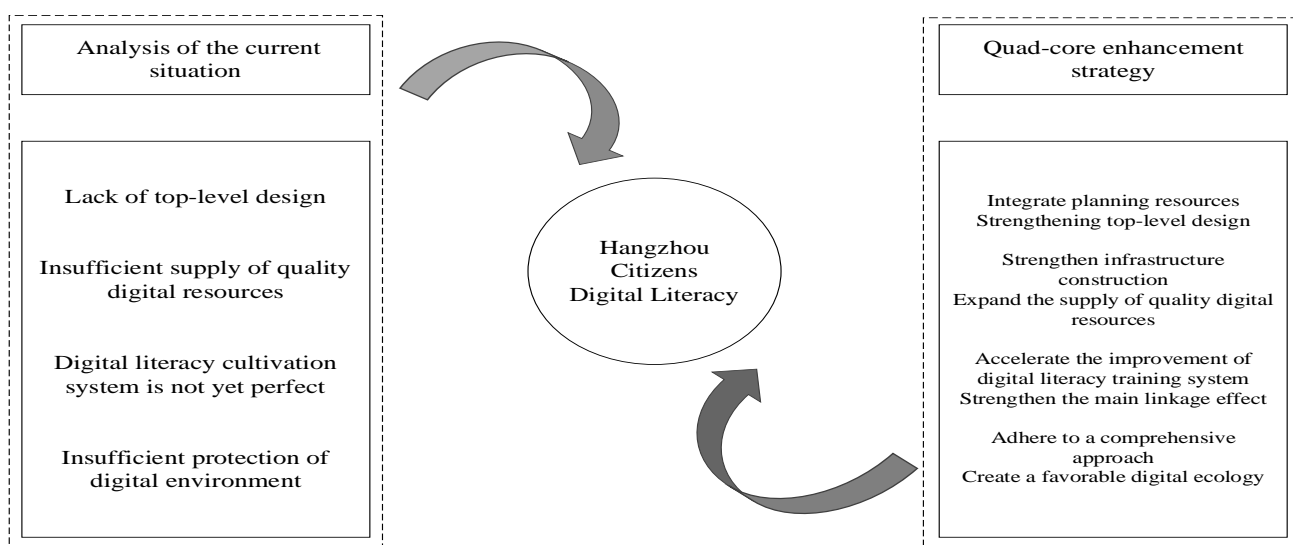


Figure 1 Digital Literacy Enhancement Strategy for Hangzhou Citizens

Integrate resources and strengthen top-level design

Overall resource planning plays a crucial role in improving the utilization rate of digital resources and optimizing the layout of digital resources, providing important conditions for the improvement of digital literacy of HCM City citizens. With the implementation of the Outline of Action, the local municipalities are paying more and more attention to the overall digital literacy development of citizens, providing resources such as digital culture and digital technology, and improving the active participation of citizens in digital life by optimizing digital government and digital activities. In terms of resource planning, the government should formulate information and data collection, comprehensively manage the overall resources, base on the overall development needs of the localities, carry out short-term and long-term planning of digital resources, and pay real-time attention to the dynamics of digital development to make adjustments to the inputs of digital elements, so as to further adapt to the needs of the improvement of digital literacy of the local citizens. In terms of resource allocation, localities should continue to maintain the advantages of digital construction, appropriately increase the input of digital resources, while optimizing the input method of digital resources, digital resource allocation through big data, information cloud technology, etc., and increase the input and innovation of digital human resources, digital cultural resources, and digital scientific and technological resources, so as to improve the digital allocation index of Hangzhou.

Top-level design is to look at problems from a global perspective and formulate strategic plans from a holistic viewpoint. Enhancing citizens' digital literacy is a systematic project, and it is necessary to have a global awareness, discover and grasp its essence through adjusting the top-level design, and lead it to develop in a benign direction. The top-level design needs to be complemented by a sound policy system, and local governments should formulate and optimize policies for improving citizens' digital literacy based on research and combined with the development strategy, so as to stimulate the subjective initiative and motivation of citizens' digital literacy cultivation. At present, there are big differences in the level of digital economy development and citizens' digital literacy between regions and cities and towns, and the government should strengthen the top-level design of digital literacy in response to the different status quo and problems, and provide correct direction and guidance for the lower units (districts, counties, townships, etc.). First of all, Hangzhou should improve the theoretical system of enhancing citizens' digital literacy, sort out the literature on the connotation, development history and system structure of digital literacy, draw on the top-level frameworks of other provinces, cities, countries and international authoritative organizations to enhance the people's digital literacy (e.g., the EU's Digital Literacy Framework, Dig Comp 2.1, the Irish Digital Framework), and analyze short-listed practices in previous practices based on the practice of enhancing the people's digital literacy in different

areas of the country. practice, analyze the shortcomings and deficiencies in past practices, identify the breakthrough points for enhancing people's digital literacy in light of the current situation and problems of local people's digital literacy, improve the top-level design for enhancing people's digital literacy, and promote the further integration of theory and practice, so as to provide a theoretical basis for the enhancement of digital literacy. Secondly, the top-level design of citizens' digital literacy should be adjusted in line with the national policy, and Enhancing Digital Literacy of All Citizens specifies the development goal of enhancing digital literacy of all citizens, providing a clear direction and strategic guidance for the practice of the government, enterprises, colleges and universities and other subjects. Finally, it should closely follow the development goals and the needs of the digital era, combine relevant policies and the laws of digital economy development, design corresponding cultivation contents, cultivation methods, cultivation programs, etc., for people of different cultural levels, different ages and different regions, and formulate a strategic plan to enhance citizens' digital literacy with local characteristics, strengthen the top-level design of citizens' digital literacy enhancement, and promote the enhancement of citizens' digital literacy from the whole situation.

Strengthening infrastructure development and expanding the supply of quality digital resources

The construction of digital infrastructure such as 5G network, Internet, Internet of Things, artificial intelligence, etc. is gradually accelerating in HCM City, providing learning and activity guarantee for citizens' digital life, which is an effective way for regional citizens to develop digital literacy. The popularization of digital information services and the creation of a high-quality integrated digital resource platform through the improvement of digital infrastructure enriches the digital life of citizens and increases their participation in digital life. Digital infrastructure is a key step for citizens to get in touch with digital life and adapt to the digital era, so HCM City should continue to promote the optimization of the overall digital infrastructure in conjunction with the needs of the digital era to provide more opportunities for citizens to participate in digital life. In particular, it is necessary to accelerate the layout of fixed telecommunication infrastructure in rural areas, empower rural revitalization with the concept of digital economy, promote the digital transformation of clothing, food, housing and transportation in rural areas in all dimensions and at all levels, bridge the digital divide between urban and rural areas, and narrow the gap between urban and rural areas. For some remote areas, rural areas and impoverished families, it is possible to formulate special subsidy policies for these areas and groups after examining the actual situation on the ground, reduce their digital access costs, and provide them with low-priced or even free digital information services, so as to balance the phenomenon of digital inequality as soon as possible. Because some people in rural areas are limited by their own cultural level, there is a natural sense of resistance to modern digital technology, the local government

can increase the popularization of the Internet and other digital technology publicity, and appropriately carry out the relevant digital skills training, do not let the hardware idle, in the implementation of the digital countryside strategy at the same time to improve the people's digital literacy, and the improvement of the people's digital literacy will also promote the construction of the digital countryside. For people who have not yet come into contact with digital technology, the government should accelerate the construction of digital infrastructure so that they can accept digital culture and technology as soon as possible, and adapt to the digital era as soon as possible; and for a larger number of people who have mastered the basic digital technology, it should accelerate the construction of an integrated digital resource platform that meets their own needs, so that the public can participate in the digital life more efficiently and promote the enhancement of digital literacy by implication, and experience the charm of the digital era in the practice of life. Experience the charm of the digital era in the practice of life.

For example, Zhejiang Province realized at an early stage that the fragmentation of digital resource provision and insufficient sharing of digital resources had led to the problem of information and data silos, and through the concerted efforts of various departments and regions, the IRS (Integrated Digital Resource Platform) was put on line in September last year. Relying on the IRS can realize the application function of the whole through, realize the province's digital resources sharing, avoid the duplication of construction leads to waste of resources, but also dissolve the "data barriers" caused by the information island, in line with the trend of the digital era. The government should, on the basis of an in-depth understanding of the public's digital literacy needs, continue to improve the relevant technology and hardware, and continue to build a high-quality integrated digital resource platform that meets the needs of the public. The supply of digital resources is unbalanced, mostly focusing on digital technology, and is relatively weak in terms of citizens' digital literacy, so the process of building digitalization should expand the quality resources for digital literacy enhancement, such as the guidance of digital talent resources, the dissemination of digital cultural resources, and the popularization of digital technology resources, so that citizens can enjoy the speed and convenience brought by digital quality resources in their lives and activities, and truly realize digital human cultural development, and also can promote the transformation and upgrading of Hangzhou in the digital era through the cultivation of citizens' digital literacy.

Accelerating the improvement of the digital literacy training system and strengthening the main linkage effect

Based on the problems of the digital literacy training system, HCM City should optimize the digital literacy training system based on the relevant dilemmas and the different characteristics of different

targets (i.e., the elderly, young people, students, etc.), and in the light of the actual development of the digital era. The "five forces" model of digital literacy (perception, innovation, integration, absorption and development) can be constructed to improve citizens' digital comprehension and application ability. When building a digital government and digital society, it is necessary to strengthen the education and publicity of digital literacy, use digital practices to stimulate citizens' digital awakening and digital perceptiveness, so that citizens can feel the importance of digital information and digital economy in a subtle way, and cultivate their digital literacy. For the elderly, through the Internet, television, radio, newspapers and other media, the elderly can feel that digital technology and digital culture are around them and stimulate their initiative to independently learn the latest developments in digital governance in the digital age, such as participating in digital government to deal with personal and public affairs, while learning and accepting digital technology and digital tools, and improving problem-solving ability through improving digital literacy. For the elderly, it is mainly government and social guidance that encourages them to participate in digital life by organizing offline activities, such as some exchanges at senior service centers, to stimulate their interest in digital culture and technology, to cultivate their digital integration and absorption, and then to enhance their digital literacy. As most young people have better digital perception and absorption, attention should be paid to cultivating their absorption, integration and innovation in digital literacy. HCM City should focus on cultivating young people's basic knowledge and skills in the use of digital equipment, cultivating their digital integration power in conjunction with their practical work, establishing a sense of digital innovation based on the learning of digital culture, forming the ability to access, use, understand, communicate, and integrate digital resources in their digital life and work, and improving their adaptability in the digital era. At the same time, a group of high-quality digital professionals should be cultivated, and the digital ability cultivation of ordinary youth should be guided through the talent-driven mechanism, so that they can be integrated into digital life through their work, and gradually form the digital practice ability to reasonably judge and scientifically cope with risks, so as to improve their digital literacy in practice, and should pay attention to cultivating young people's digital development ability and innovation ability after they have the basic digital literacy, and with the support of digital culture constantly explore new digital technologies and improve digital construction in the digital era. For students, they should cultivate their digital perception ability and digital absorption ability, and digital literacy education should cover digital knowledge and skills, focusing on students' digital practice ability while cultivating their digital culture awareness.

Despite the leading level of digitization in some areas, the digital literacy of citizens is at different levels and has large gaps, so the construction of a precise and characteristic enhancement system is a necessary step, which helps to improve the quality and efficiency of citizens' digital literacy enhancement. There

are still some citizens who have not yet been exposed to digital culture and digital technology, and their ability to adapt to the digital era is poor, even affecting their daily life. A basic digital literacy training system should be established for such people, focusing on exposure to basic digital products and services and aiming to address their daily needs. First, social institutions and the government can build a variety of different daily scenarios, such as digital government errands, hospital visits, public transportation use, etc., starting with basic daily training in small things, and at the same time training them in basic digital literacy, so that this type of citizens can achieve acceptance of digital literacy and technology, and improve their ability to initially adapt to the digital age; second, the government and social institutions can regularly organize simple digital activities and Secondly, the government and social institutions can regularly hold simple digital activities and lectures, etc., so that they can learn the use of electronic products and other basic digital products, so that they can experience the charm of digital life, and enhance their subjective initiative to learn; finally, the government and social institutions can organize volunteers to answer questions and solve problems in the community or street as a unit, so that this kind of citizens can understand more about life in the digital age, and in the gradual exploration of the layers, to stimulate the exploration of citizens' enthusiasm, and progressively Enhancing digital literacy. At the same time, there are quite a number of citizens who can simply utilize digital technology and understand part of the shallow digital culture, but have not yet fully adapted to the new changes in the digital era. These citizens can solve most of the difficulties in daily life and have basic digital literacy. For these citizens, the government and social organizations should pay attention to their exploratory ability, encourage them to actively learn and explore the new knowledge of digital culture and technology, form the ability to learn by example, and improve the efficient conversion ability of digitization while meeting their own needs, so that they can transfer complex offline affairs to simple online practices.

CONCLUSION

A good digital ecology is the guarantee for the improvement of citizens' digital literacy, and the government should create a good digital ecological environment from multiple perspectives. As the level of digitization continues to improve, uncivilized digital phenomena are emerging, which to a greater extent affects the enthusiasm of citizens to participate in digital life, so the government should carry out scientific intervention to ensure a healthy and benign digital environment. Firstly, the government should introduce relevant policies and introduce suitable laws and regulations according to the current situation of digital development to regulate the behavior of citizens from the legal level; secondly, the government should increase the supervision, optimize the means of supervision, and take measures such as monitoring and reporting system to carry out comprehensive supervision, so as to reduce the

unregulated and unethical behaviors of the digital life; lastly, with the emergence of the leakage of personal information and the use of personal information by the application of digital technology, some citizens, out of fear for their personal information, have become more and more active in the digital life. crimes and other behaviors, some citizens refuse to use digital products for fear of their privacy and security, and even develop the emotion of resisting the digital era; therefore, the government should protect the information security of citizens, safeguard their personal privacy, and crack down on the illegal use of citizens' information. The government should organically combine legal and administrative means to guarantee a favorable digital environment through comprehensive measures. Under the coercive means, the government should combine some of the guiding measures to carry out relevant digital activities through the construction of digital culture and digital technology synergistically to guide the citizens to participate in the digital life correctly, and to provide a good ecological foundation for the citizens to enhance their digital literacy.

The construction of the digital era and the improvement of citizens' digital literacy cannot be separated from the active participation of all subjects, and a good digital ecology requires the standardized behavior and joint efforts of all subjects. Firstly, online platforms should protect users' privacy and put an end to criminal acts such as information trafficking, forced software installation and forced advertisements, and at the same time ban citizens who violate morals and systems, so as to guide users to standardize the use of online platforms; secondly, social institutions should follow the law and morals when organizing digital activities, and put an end to criminal acts such as forced sales and indiscriminate charging, etc. When citizens participate in the digital life, the activities of social institutions are an important way to obtain digital culture and learn digital technology, which is the main platform to a greater extent. The activities of social institutions are an important way for citizens to participate in digital life, and they are the main platform for acquiring digital culture and learning digital technology, which affects the enthusiasm of citizens to participate in digital life to a greater extent, therefore, social institutions should correctly carry out the relevant digital activities in the community or street as a unit to create a good digital ecosystem; lastly, the citizens should set up a correct view of morality and values, and maintain rationality in digital life, and put an end to the use of digital technology to carry out crimes such as fraud and improper speech on digital platforms. crimes and unethical behaviors such as making inappropriate remarks on digital platforms, and correctly participate in life in the digital era and continuously improve their digital literacy in the digital era.

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