The Sustained Reproduction of the Urban-Rural Digital Divide and Digital Inequality

Ngai Zhan*

Shenzhen College of International Education,Shenzhen,518043, China

*Corresponding author. Email:azhan3257568072@gmail.com

Abstract. This study explores the phenomenon of the continuous reproduction of the digital divide and digital inequality between urban and rural areas in China. With the widespread application of information technology in various fields, the gap in access to digital resources and development opportunities between urban and rural areas is gradually widening. This article analyzes different aspects of the digital divide, including cognitive disparity, equipment disparity, resource disparity, and disparity in usage purposes. Rural youth are introduced to the internet relatively late and primarily use digital devices for entertainment rather than enhancing their skills, which exacerbates digital inequality between urban and rural areas. Additionally, factors such as family education levels and socio-economic backgrounds further widen the digital usage gap for rural children. This article argues that narrowing this digital divide is crucial for achieving balanced development between urban and rural areas and promoting social equity.

Keywords: Rural Youth, Digital Divide, Digital Inequality, Digital Literacy

1 Introduction

The 21st century is the era of information technology, where digital resources and digital capabilities have a significant impact at the individual, regional, and even national levels. At the same time, the phenomenon of inequality based on digital

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resources and capabilities has gained global attention. In the current social environment of China, due to the disparities between urban and rural areas, the digital divide has gradually become a significant dilemma that seems to have been bridged, yet still exists in reality.

China's digital divide, inequality, and regional development are closely related. As many people choose to migrate to urban areas within the country and settle in major cities, an increasing number of migrant workers officially become part of the urban population, and their children are likely to continue living in the cities. The further widening of population disparities has amplified the trend of urban-rural dualism. As cities develop rapidly, rural areas are gradually falling behind, leading to a series of urban-rural inequality issues. These issues are reflected in economic factors such as infrastructure investment, employment opportunities, and developmental potential, as well as in social and cultural disparities manifested in overall education levels, cognitive abilities, and skill competencies. These disparities have led to a gradual deterioration of the foundational gaps in urban and rural social development and have gradually given rise to a digital divide based on various disparities in internet resources. This may result in the reproduction of digital inequality and the loss of social mobility opportunities. This article analyzes the urban-rural digital divide in the digital era, as well as the digital inequality faced by second-generation rural migrant youth and its subsequent impacts [10].

2 Digital Divide and Digital Inequality.

The digital divide, also known as the information gap, is a disparity in information arising from the inconsistent pace of development across different regions, leading to significant gaps between urban and rural areas in terms of access to resources and opportunities. This gap further results in socioeconomic disparities, such as income inequality and educational inequalities [7]. As the pace of urbanization in China accelerates and the internet becomes indispensable for accessing resources such as healthcare, education, and employment [1], the gap between urban and rural areas is gradually widening, especially given the slow increase in internet penetration in rural areas.

In 2002, Jan Van Dijk first proposed a framework for research related to the digital divide and subdivided this concept into four different types Lack of access: lack of spiritual access, lack of material access, lack of technical access, and lack of access to

use. Based on this, scholars generally operationalize the digital divide into access gap and use gap. Some scholars further believe that the knowledge gap is the third gap of the digital divide theory, and the above digital divide at different levels points to the mass group.

3 The Digital Divide: The Gap in Digital Access.

3.1 Cognitive Gap

In modern rural China, the foremost issue is the public's inadequate understanding of the Internet. For example, among non-internet users in 2014 and 2015, as many as 61.3% and 60.0% of the population reported that they "do not understand the internet/computers." The lack of understanding and awareness of the internet itself indirectly leads to the public's inability to accurately assess the impact that internet devices could have on their lives.

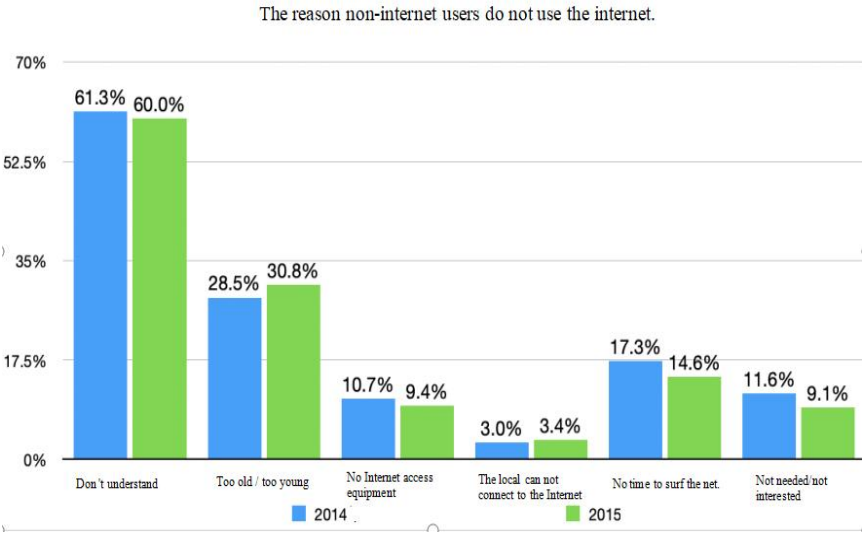

Fig. 1. : Comparison of the reasons why rural non-Internet users do not use the Internet in 2015 and 2014 [1]

From Figure 1, it is evident that the digital divide between urban and rural areas is further widening [3]. There is a significant gap in the age of first exposure to the Internet between urban and rural children. Over 26.4% of urban children had initial

contact with the internet before elementary school, while only 12.2% of rural children had similar exposure during the same period. In addition, as children grow older, the gap in their understanding of the internet and digital technology has not significantly improved. According to statistics, 39.2% of children in rural areas do not have online experience until after the age of 10, while only 26.6% of urban children first go online after turning 10. This results in rural children being clearly at a disadvantage compared to urban children in their understanding of new media, leading to early disadvantages and contributing to the emergence of a future digital divide[3].

3.2 Physical Equipment Gap

The existence of the physical access gap is one of the most direct factors contributing to the information divide in rural areas. The internet penetration rate in rural areas is far lower than that in urban areas. At the same time, the direct resource gap restricts rural residents' opportunities to access new media and diverse information. Although the rural internet penetration rate gradually increased from 7.4% to 31.6% between 2007 and 2015, by 2015, the urban internet penetration rate had reached 65.8%(figure 2), while the rural internet penetration rate had not even reached half of that of urban areas. This resulted in the rural population naturally lacking opportunities to access new media and the internet, thereby creating an information access gap.

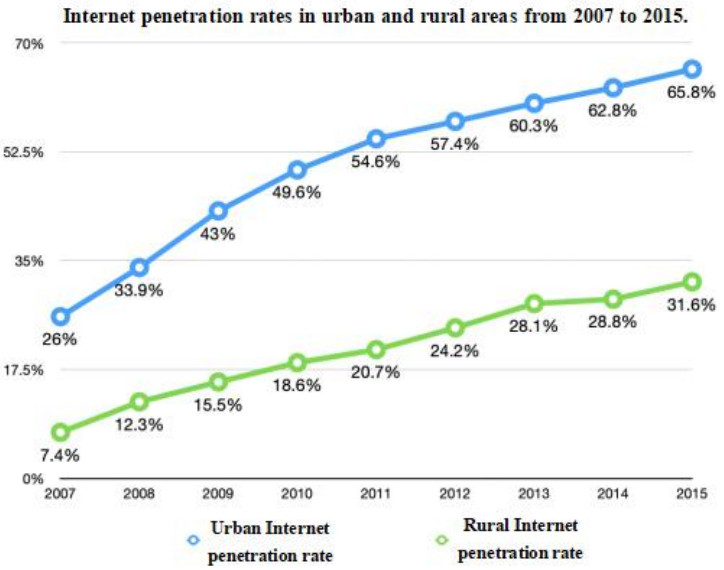

Fig. 2. Urban-rural penetration rate from 2007 to 2015 [1]

The physical access gap is also reflected in the devices used by the second generation of rural residents compared to those in urban areas. In 2015, in rural areas, apart from the cell phone penetration rate reaching 62.3%, which is comparable to 63.8% in urban areas, there were significant differences in other devices compared to the urban population of the same age. In terms of smartwatch ownership, the rate among urban underage internet users reached 34.2%, significantly higher than the 21.4% among their rural peers.In terms of tablet computers, the ownership rate of urban underage netizens reached 27.5 %, higher than 18.2 % of rural peers(figure 3).Relevant research shows that there is a moderate correlation between the efficiency reduction of mobile phone users and the use of mobile phones. Due to the weak self-control of minors, mobile phone addiction can easily lead to more negative effects, such as decreased attention, inability to focus on academic and memory decline. Therefore, the argument that the ownership rate of mobile phones is not valid for reducing the physical access gap[2].

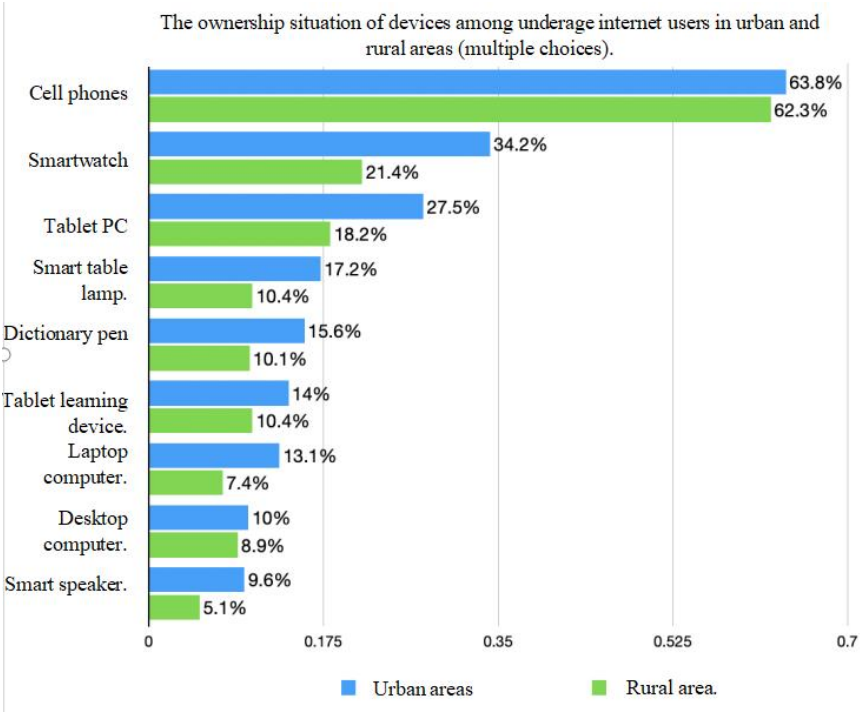

Fig. 3. Comparison of device ownership among underage internet users in urban and rural areas between 2015 and 2014 [3].

Other smart devices with significant gaps in ownership rates have a more pronounced impact on enhancing the productive capacities of underage internet users. Devices such as smart desk lamps, dictionary pens, and laptops can provide significant productivity enhancements, as they are capable of performing specific functions and providing the necessary prerequisites for certain tasks, such as specialized software. It is evident that the disparity in ownership rates of devices aimed at reducing the physical access gap intuitively reflects some of the differences faced by underage internet users in urban and rural areas.

3.3 Regional Resource Gap

In addition to individual families, the gap in overall resources between rural and urban areas has also created the emergence of digital access ditches, including infrastructure investment and the overall education level and income level gap in the social structure.

From a regional financial perspective, the overall budget allocated to rural areas is quite limited compared to urban areas. The analysis report on the urban-rural disparity in per-student funding for compulsory education, published in 2022, indicates that while the per-student public education budget expenditures for rural primary and middle school students gradually approached those of urban areas during the period from 2007 to 2013, the per-student gap between rural and urban students has once again widened after 2013 due to the declining growth rate of funding each year. The investment gap accumulates yearly, resulting in a worsening imbalance and disparity between urban and rural areas[9]. In addition, the report visualizes the urban-rural gap in terms of data by comparing the per capita general public budget education funding for elementary and middle school students in rural areas and towns[6]. Although the disparity in per capita personal budget between rural and urban students is relatively small, there is a significant gap in the per capita budget for public services and infrastructure between students in rural areas and those in cities.

In the infrastructure component ratio, the investment gap in hardware facilities reaches a much larger gap. The ratio of infrastructure for primary and secondary school pupils in rural and urban areas in the country as a whole ranges from 0.4

to 0.1, which shows that rural areas currently receive very limited investment in infrastructure. Compared to the stable inputs from towns, after 2013, the budgets received by rural areas have come to a low point in recent years[8]. The overall rural-urban input gap can be seen as an early warning of a widening digital usage divide. These phenomena can lead to rural students facing a decline in personal enhancement efficiency, thus lagging behind their urban counterparts in the same age bracket and widening the divide [5].

4 The Digital Divide: The Gap in Usage.

4.1 Use Purpose Gap

In terms of Internet use, the habits of the underage farming generation are also significantly different from those of their urban peers. In a report analyzing the purpose of new media use among rural children in Southwest Shandong Province, it can be seen that playing games, swiping videos, watching anime and manga, and chatting are the main trends. Rural children generally use new media equipment to satisfy emotional value. This kind of use as entertainment is relatively easy to cause addiction and other problems. It is impossible to obtain growth, exercise thinking ability, and critical ability by limiting new media to entertainment purposes (figure 4)[12].

Usage Behavior	Percentage
Online learning	36.3%
Play games	76.0%
Chats	61.0%
Watch the video	84.0%
Watching anime/manga	51.0%
Watch live (games)	38.0%
Cheer for idols	38.7%
Using social networking sites	41.0%
Search information	64.0%

Fig. 4. Motivation of Internet use among children in Southwest Shandong[12]

There is a big difference between urban and rural underage Internet users in terms of the purpose of using the Internet. More urban populations are utilizing the Internet for personal advancement, access to information, and access to resource programs. Urban populations are more cognizant of how to use new media to have a positive impact on them. In terms of entertainment, rural children face the problem of using entertainment as the primary purpose of new media use, and there is little difference between rural underage Internet users and their urban counterparts when it comes to engaging in more popular activities that provide emotional value. This kind of use of new media will be one of the reasons for the digital use gap between rural and urban underage netizens(figure 5)[13].

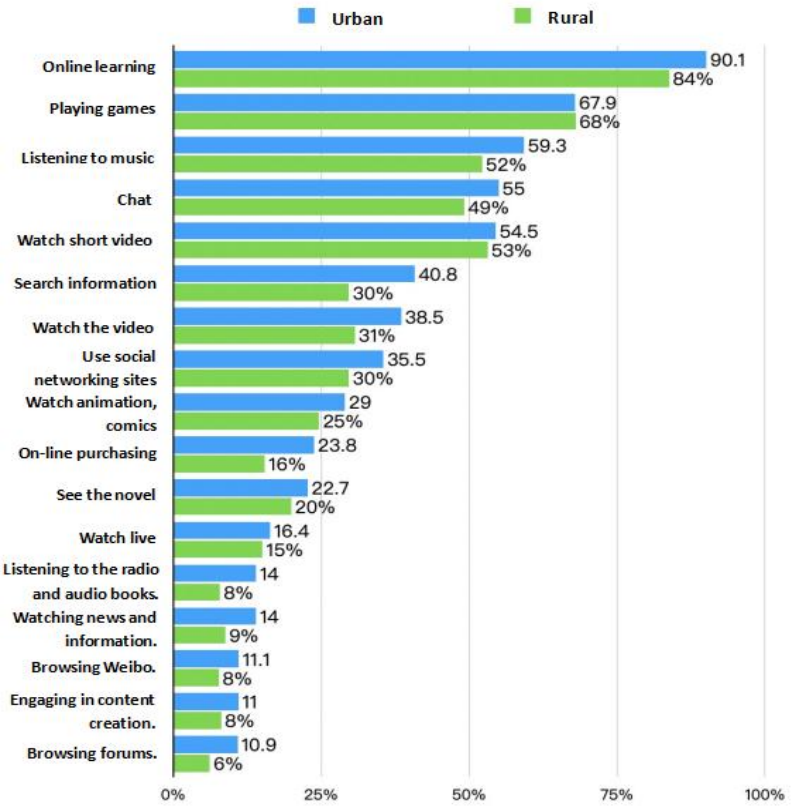

Fig. 5. Comparison of the proportion of urban and rural underage netizens who often engage in various activities on the Internet in 2023[13].

4.2 Cyber Literacy Gap

The lack of awareness of new media among the second generation of farmers also leads to the problem of weak information recognition. In the report on media awareness, most of the children lacked the necessary competence in media awareness, which reveals that children do not have a mature understanding of cyber safety and cyber awareness(figure 6).

Subject	Mean Value	Mode
I know the difference between advertising and real life.	3.03	3
Network information is not all real.	2.75	2
I can always use search engines to search for the information i need.	2.97	3
In case of account theft or network fraud, i will inform teachers and parents in a timely manner.	3.20	3
Chatting with strangers on the internet without revealing your private information casually	3.02	3
Online encounter unhealthy content (such as violence, blood, pornography) will consciously close the relevant page	2.64	2
Attacked on the network i will find a way to fight back	2.32	1

Fig. 6. Children 's media information cognition in Southwest Shandong [12]

4.3 Social Factors: Family and Parental Influence

Social problems such as family education and parental differences between urban and rural areas may further promote the digital use gap. For example, left-behind children are often associated with being addicted to the Internet, and the core problem lies in parental neglect of their children, including “the chronic neglect of basic needs for child development by caregivers, such as emotional, physical, supervisory, and cognitive needs” [11], and the urban-rural gap in this neglect is also growing. Research on child neglect has shown a positive correlation with causing adolescents to become addicted to the Internet and pick up bad Internet habits, negatively affecting many aspects of development such as physical and mental health, academic progress, and ultimately further contributing to the phenomenon of the digital divide[11].

The educational divide between urban and rural populations may also further contribute to the emergence of a data use divide. Comparatively speaking, when parents in the household have higher levels of education and more years of schooling, their proficiency and skills in the use of information technology are fuller and more

adequate, and they are better able to understand all aspects of the use of the Internet and new media.In this case, families will be relatively more open to children's access to electronic devices and electronics, and parents will be better equipped to guide their children to effective use of electronics.According to statistics, children in families with higher levels of education are more restrained in their use of electronic devices and new media and have better self-control. At the same time, children in these families have a higher tendency to use electronic devices for educational purposes rather than for recreational purposes. This shows that there is a positive relationship between the level of education in the family and children's Internet use.

However, the gap between the average educational attainment of the rural and urban populations further contributes to the fact that rural children may lack an environment in which to use electronic devices. Combined with the fact that a large number of students from peasant backgrounds but with advanced degrees are choosing to go to the cities, the average level of education in the countryside is much lower than in the cities. And the same lack of education for the adult population is likely to lead to a lack of positive guidance for rural children regarding the use of devices, which can lead to the ownership of electronic devices becoming items that widen the information divide[4].

5 Conclusions

The digital divide is currently one of the most intuitive inequalities caused by the urban-rural divide. First of all, from the perspective of the digital access divide, children and youth in rural areas easily fall into the digital divide due to their knowledge of the Internet, the physical access divide, and the lack of resources in the area. Lack of understanding of the Internet limits their willingness to use new media devices, and they are not aware of the convenience that the Internet can bring to their lives, but they also lack an objective assessment of the corresponding harms.

Second, relative economic backwardness also contributes to the relatively low level of rural digital access. Despite having basic electronic devices such as cell phones, there is still a lack of learning tools and equipment, such as computers, learning machines, and dictionary pens.At the same time, the economic backwardness of rural areas has led to a lack of investment in key areas. In the education sector, for example, the lack of subsidies and budgets has led to a decline in public facilities and educational resources, leaving the rural population behind in urban education from an

early stage.In terms of the digital divide, the purpose of use, Internet literacy, social issues, and the general environment all contribute to the widening of the divide.In terms of device use, rural youth are comparable to their urban counterparts only in terms of entertainment and leisure purposes. There is an overall lack of cyber literacy in terms of uplifting, learning-oriented digital tools, so they are vulnerable to becoming a group guided and influenced by extreme rhetoric, negative information, and online scams.

Furthermore, deficiencies in social and family structures, such as the problem of left-behind children, make it more difficult for rural minors to receive proper guidance on Internet use. Various reasons and factors have contributed to the unbridgeable digital divide that rural minors face today.Although in February 2021, China officially announced that up to 98.99 million of the country's poor had been lifted out of poverty, and there are generally positive perceptions and predictions of a narrowing of the urban-rural gap, blindly assuming that the rural population is currently in a period of euphoria will lead to a misjudgment of the actual situation.Inequality such as the digital divide, which appears in the new era, is likely to become the most common and serious inequality. For a long time in the future, the digital divide will inevitably become the cause of the widening gap between the rich and the poor, a social structural problem.

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