

Research on the Digital Divide and Employment Inequality Among Older Adults Against the Backdrop of Population Aging: A Literature Review and Case Analysis

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ABSTRACT

With accelerating population aging and the expansion of the digital economy, elderly domestic workers face structural employment challenges due to insufficient digital skills. This study examines adaptation and exclusion mechanisms for the elderly in digital employment environments through literature review and comparative case analysis. Findings reveal: First, regional disparities significantly impact employment opportunities and pathways for elderly domestic workers; Second, platform mechanisms exhibit divergent levels of acceptance toward the elderly, with commercial platforms demonstrating greater exclusion; Third, individuals commonly struggle with digital skill acquisition and psychological adaptation, further exacerbating re-employment inequality. This research not only extends the application of digital divide theory to aging employment but also offers practical insights for optimizing domestic service enterprises' workforce training strategies and advancing age-friendly digital policies.

KEYWORDS

Population aging; Digital divide; Elderly employment; Digital economy; Social security

1 Introduction

As population aging deepens and the digital economy rapidly expands, elderly domestic workers face structural employment barriers due to insufficient digital skills, highlighting growing employment inequality. Employment opportunities for the elderly not only affect their economic independence and quality of life but also directly impact societal fairness and inclusivity. In this context, the digital divide has become a key mechanism exacerbating employment inequality: older adults are disadvantaged in job-seeking channels, skill requirements, and performance evaluations. For instance, they struggle to enter employment systems reliant on online order placement, lack the capacity to navigate information exchange and procedural norms within platform-based services, and are more easily marginalized under digital evaluation systems. These factors collectively subject elderly domestic workers to multiple pressures during digital transformation.

Through literature review and comparative case analysis, this paper delves into the adaptation and exclusion mechanisms of the elderly in digital employment environments. Findings indicate: First, regional disparities significantly impact employment opportunities and pathways for elderly domestic workers; Second, platform mechanisms exhibit divergent levels of acceptance toward the elderly, with commercial platforms being more exclusionary while community-based platforms demonstrate relative tolerance; Third, individuals commonly encounter difficulties in acquiring digital skills and psychological adaptation, which substantially exacerbates re-employment inequality. This study not only extends the application of digital divide theory to aging employment research but also offers valuable insights for enterprises to optimize training and employment strategies and for governments to advance age-friendly digital policies.

This paper first introduces the research background and significance while reviewing relevant literature. It then outlines the methodology, detailing the implementation of the literature review and case analysis. Subsequently, it presents empirical findings based on regional, platform, and individual dimensions. Finally, it summarizes key discoveries and proposes policy recommendations.

2 Literature review

In recent years, international research on the relationship between the digital divide and the elderly labor market has deepened. Van den Broek (2022) points out that among European countries, Sweden has a significantly higher employment rate for older adults than France, primarily due to employer bias against older workers and the mismatch between older adults and digital skills. Van Dijk (2005) proposed a "four-tier digital divide model" —encompassing motivational access, physical access, skill access, and usage access—providing theoretical grounding for understanding how older adults face marginalization in the labor market due to insufficient digital skills. He emphasized that the skill gap and usage gap constitute core barriers to digital inclusion among older adults. In Japan, Xie Lili's (2022) research found

that delayed retirement policies and pension system reforms effectively boosted labor participation among older adults, particularly those aged 65 and above, though informal employment remained prevalent. Some scholars further note that while digital platforms offer certain advantages in resource allocation, the actual benefits for older adults remain limited due to their weaker technological adaptability. At the technical level, international research also highlights the importance of age-friendly design, attention mechanisms, and platform structural optimization in mitigating digital exclusion.

In contrast, domestic research on the relationship between digital technology, the digital divide, and elderly employment, though starting later, has developed rapidly and diversified. Sa Zhihong (2019) noted that the domestic service industry has become a significant channel for absorbing low-skilled elderly labor, but most elderly domestic workers struggle to secure orders through mobile platforms, thereby limiting their labor participation efficiency. Xiao Zhouyan et al. (2024) argue that industrial upgrading within the digital economy has further intensified structural differentiation in the job market, with low-skilled older adults facing pronounced marginalization in the labor market. Kuang Yalin (2022) employs grounded theory to identify five dimensions of digital barriers faced by older adults: physiological decline, psychological resistance, non-age-friendly software/hardware, lack of social support, and insufficient digital literacy. Wu Wenying et al. (2023) further point out that generational divides, disparities in urban-rural digital infrastructure, and the stratification of virtual social circles intensify digital exclusion among the elderly. Zhang Lin (2014) found that 68% of domestic workers lacked formal labor contracts, depriving them of basic legal protections and heightening risks in the digital labor market. Liu Cheng et al. (2023) observed that while digital platforms can reduce resource mismatch rates by approximately 21%, older workers struggle to benefit fully due to skill gaps. Research by Wu Peng et al. (2024) and Sa Zhihong (2019) jointly emphasizes that rural elderly have low internet penetration rates and face high risks of wage arrears, while female domestic workers endure dual cultural and economic exclusion. Consequently, scholars widely recommend integrating digital skills training into the "Domestic Service Revitalization Program" and strengthening policy safeguards for elderly workers' rights.

2.1 Research review

Reviewing relevant domestic and international findings reveals several areas of academic consensus: the interplay between population aging and digital economic development exacerbates employment challenges for the elderly; insufficient digital skills constitute a core barrier to the elderly's participation in the digital labor market; and regional development levels, gender disparities, and institutional arrangements further amplify these effects. However, existing research also exhibits certain limitations: most studies remain at the macro level of institutional or structural analysis, lacking in-depth examination of the micro-level experiences of specific occupational groups; There is insufficient exploration of effective pathways for digital skills training, and systematic research on the exclusionary role of platform mechanisms in the employment process remains scarce. Particularly in the domestic service sector—a quintessential field for elderly employment—empirical studies remain limited, making it difficult to fully illuminate the predicament of elderly domestic workers amid digital transformation. Addressing this research gap, this paper focuses on the elderly domestic worker population, aiming to enrich existing theories while proposing more targeted policy recommendations.

2.2 In summary

Both international and domestic research reveals that while digital technologies drive the upskilling of labor markets, they simultaneously exacerbate the marginalization of older adults. The digital divide not only restricts older adults' access to quality employment opportunities—particularly evident in low-skilled positions—but also perpetuates disadvantages in income levels and social security coverage. Simultaneously, older adults face both physiological and psychological barriers in adapting to digital environments, compounded by insufficient social support and institutional safeguards. Future research should explore an integrated mechanism encompassing "skill adaptation pathways—platform aging-friendly modifications—policy-institutional coordination." This approach would incorporate digital training into national strategic frameworks, advance the realization of "digital reverse mentoring," and deepen theoretical understanding of the interplay between digital exclusion and labor market transformation in an aging society.

3 Research methodology

This paper primarily employs literature review and case analysis methods.

First, in implementing the literature review method, the author systematically searched relevant domestic and international research literature from the past decade using core keywords such as "population aging," "digital divide," and "elderly employment" across platforms including CNKI, Wanfang Database, and Web of Science. This was

supplemented by key theoretical frameworks (e.g., van Dijk's four-level model of the digital divide). In literature selection, priority was given to empirical studies and theoretical papers from core journals such as CSSCI and SSCI, supplemented by policy reports and survey materials. Through the systematization and synthesis of these sources, an analytical framework of "population aging—digital divide—employment inequality" was constructed, identifying gaps in current research regarding empirical data and case validation. This methodology serves to provide a solid theoretical foundation for the research, clarify the context of previous conclusions, and thereby highlight the necessity and innovation of this study.

Second, the case study method is employed, focusing on elderly domestic workers as the primary subjects. This group exemplifies urban re-employment challenges due to its large size and widespread issues of advanced age, limited education, and insufficient digital skills, thereby concentrating the employment dilemmas arising from the interaction between population aging and the digital divide. Case materials primarily draw from Sa Zhihong's (2019) respondent-driven sampling survey in Beijing and Jinan, Zhang Lin's (2014) field research in Wuhan, supplemented by Wu Peng's (2024) findings on urban-rural digital divides. The analysis focuses on elderly domestic workers' experiences regarding digital tool usage, job-seeking channel selection, income and labor protections, and the comprehensive challenges encountered in employment. It aims to reveal their actual circumstances within the digital employment system. The case study approach concretizes macro-level demographic and structural issues through the real-life experiences of a specific group, thereby enhancing the explanatory power of research conclusions and providing targeted insights for refining relevant policies and practices.

4 Results analysis

Drawing on research reports and literature, this analysis unfolds across three dimensions:

4.1 Impact of population aging on employment structure

Population aging reduces the proportion of the working-age population, forcing certain industries to rely on elderly labor to fill vacancies. According to existing urban panel data research (Xiao, Zhouyan et al., 2024), aging significantly increases employment in low-skill industries while squeezing out medium-to-high-skill positions. This aligns with the reality in the domestic service sector: surveys indicate that a large number of elderly women re-re-enter the labor market after retirement, primarily concentrated in low-skill positions such as cleaning and caregiving, yet lacking upward mobility. This demonstrates a structural link between aging and low-skill labor.

4.2 The Digital Divide Exacerbates Employment Inequality

The digital divide poses a significant barrier to re-employment among older adults. Wu Peng (2024) found through national survey data that insufficient digital skills substantially limit older adults' ability to access job opportunities and increase income. Household worker surveys reveal that while some younger workers have adopted platform-based job acquisition, over half of older workers still rely on offline referrals and lack the ability to independently use apps. Furthermore, the digital divide manifests differently across dimensions such as urban-rural areas, gender, and health status: Rural seniors face greater lack of digital access; women lack training resources for digital use; and those with self-reported poor health have insufficient motivation to learn new skills. This compounding effect exacerbates employment inequality among the elderly.

4.3 International Experience and Policy Implications

Comparing international cases, Japan has effectively increased elderly labor participation through gradual retirement delays and diversified re-employment channels (Xie, 2022). European countries emphasize active aging strategies, where fiscal subsidies and shifting social attitudes jointly encourage older adults to continue working (Van den Broek, 2020). In contrast, China remains in an exploratory phase regarding institutional provision and social perception, particularly lacking in digital skills training and age-friendly services. International experience indicates that improving the quality of older adult employment requires dual support from institutional design and social culture.

5 Conclusion

Through literature review and case analysis, this paper systematically examines the interplay between population aging and the digital divide. Key findings are summarized as follows:

(1) Population aging broadly drives a trend toward low-skill labor market structures, exacerbating structural

contradictions and undermining the rationality of employment patterns.

(2) The digital divide significantly amplifies employment inequality among older adults, particularly in urban-rural and gender disparities, further marginalizing vulnerable groups.

(3) International experience indicates that delaying retirement, lifelong education, and the application of age-friendly digital technologies are effective pathways to alleviate employment challenges for the elderly.

(4) In the Chinese context, the state must build a "digitally inclusive aging society." Specific policy recommendations include: leveraging community senior universities and home service enterprises to promote scenario-based digital skills training and explore "one-on-one" reverse mentoring models; encouraging home service platforms to develop simplified interfaces and voice-operated features tailored for the elderly; and simultaneously improving labor contract management and social security coverage to enhance the adaptability and sense of security for older adults within the digital employment system.

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