

Digital Equity in Practice: Exploring the Gaps Between China's National Policies and School-Level Realities

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Abstract. As China accelerates its digital transformation in the education sector, the digital divide remains a significant challenge to achieving educational equity. This paper explores the manifestations of digital inequality (defined as differences in access to devices, network connectivity, digital skills, and teaching applications) in policies and practices. Through a discourse analysis of China's policies (2018 - 2025) and a case study of a rural junior high school in Jiangsu Province, this paper examines how national strategies envision digital equity and how these visions are (or are not) translated into actual conditions at the school level. This paper's results reveal the persistent gap between the national-led infrastructure planning and the actual experiences of resource-poor schools. Although policy narratives emphasize access and platform construction, they often overlook underlying challenges, such as insufficient teacher training, integrating teaching, and providing family digital support. School cases indicate that although rural and mobile students have nominal digital access, they still face disadvantages in digital participation and outcomes. This paper contends that narrowing the digital divide cannot simply rely on providing technology. Only when teaching is culture-adaptive, when the community can participate, and when teachers are trained, can a sustainable situation be achieved. The author argue that these research findings are relevant to current debates on fairness and inclusiveness in digital education and call for more localized and context-sensitive policy measures in China.

Keywords: Digital Divide, Educational Equity, Policy Discourse, Rural Education in China, ICT in Schools

1. Introduction

In recent years, China has invested significantly in digital education. These investments are part of national policies such as the Education Informatization 2.0 Action Plan and the White Paper on China's Smart Education [1-2], which emphasize the use of technology for teaching and learning, expanding digital infrastructure, and increasing access to online platforms to improve educational equity. Although these policies have achieved some success, such as increasing access to digital tools and improving connectivity, they have not eliminated all forms of inequality. In many schools with limited resources or in rural areas, digital divide issues persist, which affect learning opportunities for students [3-4].

Today's digital divide is not just about whether one has access or not. It also manifests in differences in digital teaching and learning in classrooms, teachers' confidence and preparedness to use digital tools, and the type of support students receive at home [5-6]. Most national policies define the problem in terms of access and infrastructure, but they ignore more human and contextual issues that influence how digital tools are used in practice [7-8].

In this study, we explore how digital equity is defined in education policies in China and how these definitions are played out in schools. The study draws on two sources: official policy documents from 2018 to 2025 and an interview with the principal of a rural junior high school in Jiangsu Province. This study addresses three key questions: First, how national policies define the concept of "digital equity"; second, what challenges educators encounter when attempting to implement these policies; third, what the gap is between the national vision and the actual situation of schools.

By combining an analysis of top-level policies with insights from daily school experience, this study aims to offer a more grounded understanding of the digital divide in Chinese education—and to identify what is needed to build a more equitable and effective digital future.

2. National-level policy narratives: framing digital equity through infrastructure

China's national education policies, particularly the Education Informatization 2.0 Action Plan [1] and the White Paper on China's Smart Education [2], demonstrate a firm determination to narrow the educational gap through digital innovation. These documents consistently view the digital divide as a technical issue that can be addressed by expanding the use of digital platforms, upgrading infrastructure, and distributing educational content through centralized systems. For instance, the Smart Education strategy envisions "equitable, inclusive, and high-quality learning opportunities" through the nationwide deployment of smart classrooms, cloud platforms, and AI-driven resources.

Such framing aligns with first-level digital divide theory, which prioritizes access to physical devices and internet connectivity [5]. By 2020, over 95% of China's primary and secondary schools were reportedly connected to the internet, with significant central investment in hardware and network upgrades in rural areas [9]. Over time, infrastructure construction was gradually completed, but equitable educational outcomes did not follow. Access to technology is not the sole factor determining educational equity.

Pedagogical and humanistic factors also have a profound impact on the phenomenon of educational inequality, such as differences in teachers' digital pedagogical competence, students' digital literacy, or the actual educational benefits gained from digital tools [6,10]. The emphasis remains on technological delivery rather than the quality or equity of its integration into everyday schooling.

Furthermore, while wealthy provinces may already have well-developed infrastructure and teachers with digital literacy, many rural schools still face problems such as equipment shortages, unstable networks, and limited technical support [11]. There are certain structural inequalities behind the process of digital modernization.

Yet, recent academic studies have cast doubt on this position. Firstly, Gottschalk and Weise found out that several OECD countries, including China, display an over-reliance on a top-down digital plan [7]. Such digital plans neglect the heterogeneity of real-life situations. In turn, Zhang argued that in terms of digital equity policies, China follows a dual model, featuring ambitious national outlooks and patchy and bottom-up implementation mechanisms [12]. Both situations have a particular impact on rural schools.

In other words, policy national discourses present an optimistic view of digital equity. They play a leading role in resource mobilization. Thanks to their impetus, nearly all regions have gained access to modern teaching apparatus. Nevertheless, in practice, due to regional disparities and challenges in teaching methodologies, the digital divide persists. The existence of multiple issues undermines the efficacy of digital education in addressing the root causes of digital inequality.

3. School-level realities: rural constraints and lived experiences

This study also conducted interviews with the principal of a junior high school in the rural-urban fringe of a resource-scarce county in Jiangsu Province. The interview sheds light on the tangible challenges encountered during the implementation of digital education policies in under-resourced contexts. Although the school has officially adopted the Education Informatization 2.0 Action Plan and introduced various digital platforms and devices, the day-to-day realities reveal deeper tensions between policy goals and local conditions.

Firstly, despite nominal connectivity, the school faces persistent infrastructural shortcomings. The principal reported that internet access across classrooms is often unstable and bandwidth is insufficient for simultaneous use. A significant portion of the school's digital equipment—such as computers and smart boards—is outdated or poorly maintained. Moreover, only one part-time technician is responsible for maintaining all devices and addressing technical issues throughout the school. These findings illustrate that “being connected” does not equate to functional or equitable digital access. Rather, the school exemplifies a situation where policy-defined infrastructure benchmarks are met in form but not in substance, a pattern also observed in other rural settings [13-14].

Second, the integration of digital tools into teaching practice remains limited. While the local education bureau organizes training sessions, many teachers perceive these programs as overly theoretical or disconnected from practical needs. The principal noted that participation in online workshops is often treated as a procedural obligation, with little translation into classroom application—particularly among senior staff. These observations point to a second-level digital divide: while access exists, the pedagogical confidence and competence required to use ICT effectively are unevenly distributed. Consequently, technology use in schools often remains superficial, with a limited impact on teaching quality or student engagement [6,11].

Third, students from rural and migrant families experience multiple barriers to digital participation. Although the school provides access to devices during school hours, students' home environments often lack the infrastructure or adult support necessary for sustained digital learning. Many pupils live with grandparents who lack digital literacy, and some families cannot afford stable internet connections. During COVID-19 lockdowns, these conditions resulted in disproportionate disengagement among disadvantaged students. Such findings mirror national trends and suggest that digital inequality cannot be fully addressed within the school alone—it is shaped by broader household and community-level disparities [15].

Finally, the principal described the pressure to conform to policy expectations through performative measures such as demonstration lessons and inspection visits. These showcase-oriented requirements often prioritize appearances over substance, resulting in what he termed a “compliance culture.” While intended to highlight digital innovation, such practices may divert attention from long-term, capacity-oriented goals and instead incentivize short-term, superficial alignment with policy rhetoric. This tension reveals a mismatch between policy evaluation mechanisms and the developmental needs of schools on the ground.

4. A multi-level framework of digital inequality: access, use, and outcomes

Understanding the reality of China's digital divide goes beyond the binary concept of “connected vs. disconnected.” Some studies suggest that a three-tiered conceptualization of digital inequality—encompassing access, use, and outcomes—provides a more useful lens for examining both policy realities and school realities [6,10].

First-Level Divide: Access to Devices and Connectivity.

China's national policies have made notable strides in addressing the first-level digital divide. Statistics indicate that over 95% of primary and secondary schools are now online, and rural connectivity has improved due to large-scale infrastructure projects [9]. However, as the rural case study reveals, “nominal access” often masks functional inadequacies. Devices may be outdated, bandwidth may be insufficient, and maintenance may be under-resourced. Moreover, students' home access remains uneven—particularly among migrant and left-behind children—undermining continuity of learning beyond the classroom [15].

Second-Level Divide: Skills and Pedagogical Use.

Even when physical access is achieved, disparities in the quality of digital engagement persist. Teachers in under-resourced schools often lack the training or confidence to integrate technology into meaningful pedagogical practices. As observed in the Jiangsu case, professional development programs often prioritize tool usage over pedagogical adaptation, leaving many educators to merely “check the box” without transforming their practices. Students similarly experience gaps in digital literacy; while they may use devices for passive consumption, they rarely engage in higher-order digital tasks such as collaboration, inquiry, or creative production [11,13].

Third-Level Divide: Learning Outcomes and Educational Opportunity.

The third level of the digital divide—disparities in educational outcomes—remains the least addressed in both policy and practice. Students in better-resourced schools derive more academic benefit from technology due to stronger instructional support and curricular alignment. In contrast, students from disadvantaged schools often exhibit a scattered and ineffective approach to using digital tools, which may exacerbate rather than narrow the existing achievement gap [7]. This outcome-oriented form of inequality is particularly pronounced in high-pressure education systems, such as those in China.

These three aspects collectively explain why bridging the digital divide requires a systematic approach that combines infrastructure development, capacity building, and context-based teaching methods. Focusing solely on access to digital devices cannot ensure a fair learning experience or results. On the contrary, the unequal use of digital tools can exacerbate this inequity. Reform must recognize the interactions among technological, human, and institutional factors that affect digital equity in education.

5. Discussion

Thus, digital equity must be re framed not only as an access issue but also as a capacity-building challenge. Theoretical models such as Van Dijk's multi-level digital divide framework support this view by distinguishing between access (first-level), meaningful use (second-level), and outcomes (third-level) [16]. The Jiangsu case study exemplifies this pattern: although connected to national platforms, the school struggles to generate sustained learning impact due to underprepared teachers and limited student engagement.

In response, localized, bottom-up strategies are essential to ensure reforms resonate with community needs. Equity-focused reforms that ignore local culture risk further marginalizing

disadvantaged students [3]. Rather than imposing uniform mandates, schools should adapt digital content to local languages, agricultural calendars, and students' lived experiences to boost relevance and uptake [15]. Community and parent engagement is equally critical, as many rural families lack the digital skills or resources to support at-home learning, creating a "second divide" beyond the school gate [4]. Some regions have piloted platforms that incorporate the participation of teachers, students, and parents, combining workshops, simplified interfaces, and cooperation between schools and communities to extend school reforms into the home environment [17].

Institutional leadership must also evolve: principals need to act as instructional innovators, championing experimentation, professional learning, and inclusive technology use [18]. For example, Tencent's Digital Volunteer Teaching Project pairs urban volunteer instructors with rural schools in a dual-teacher model, leveraging video technology to deliver live lessons and mentoring local educators [19]. Empirical research indicates that, with targeted support, rural teachers can effectively integrate digital tools, even under resource-constrained conditions, thereby enhancing student engagement and performance in inquiry-based tasks [14].

At the policy level, cross-sector forums organized by UNESCO have highlighted the value of "smart village" initiatives, which blend agricultural innovation with digital education to foster sustainable rural development. In the western provinces of China, a study of 462 rural teachers showed that localized professional development tailored to local curricula and community environments significantly improved the effective utilization of digital resources [20].

This research suggests that, to bridge the digital divide in Chinese education, we need to move beyond a focus on simply supplying equipment and instead adopt a more comprehensive, long-term approach. Partnerships between schools and communities will be vital in translating access to technology into equitable learning outcomes.

6. Conclusion

This study examined how digital equity in China is promoted and enacted by exploring national policy discourse in relation to everyday practices in a rural school. Although national initiatives such as the Education Informatization 2.0 Action Plan and the White Paper on China's Smart Education have expanded access to devices and internet connectivity, our study demonstrates that increasing access alone is insufficient to address digital inequality, as evidenced by inadequate teacher preparedness, limited home support for students, and challenges in integrating digital tools into everyday teaching.

A significant contribution of this research is its emphasis on the gap between national policy intentions and on-the-ground implementation in schools. Although top-down policies help mobilize resources and define priorities, they often struggle to adapt to the diverse needs and constraints of local schools. The case study from Jiangsu Province illustrates how schools may appear "digitally ready" on paper, but in practice face outdated equipment, undertrained teachers, and pressures to perform rather than improve. These issues suggest that digital equity is as much about people and practice as it is about technology.

The findings point to the importance of bottom-up, context-sensitive approaches. Empowering school leaders to make decisions based on local realities, supporting teachers through relevant and ongoing training, and engaging families and communities in students' learning are all essential to making digital reforms more effective. When digital strategies are aligned with the lived experiences of educators and students, they are more likely to support meaningful, long-term change.

Of course, this study has limitations. It draws on a single school case, which may not fully reflect the wide variation in China's educational landscape. The policy analysis is also limited to documents

published between 2018 and 2025, meaning future reforms may introduce new dynamics.

Going forward, research should encompass a broader range of schools and examine how different regions implement national policy in practice. Combining qualitative and quantitative methods would help build a more comprehensive picture. Comparative studies with other countries facing similar challenges, especially those in the Global South, could also offer valuable lessons.

Ultimately, bridging China's digital divide requires more than just devices and networks. It calls for investing in people, building institutional capacity, and supporting schools and communities to lead change from the grassroots level.

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