A Comparative Study of China and U.S.: The Influence of Digital Divide on Education Inequality and Its Mitigating Policies

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Abstract: Under the digital age, the method of learning expanded to the virtual setting. With resources shared through online platforms, digital divide became a new problem in achieving education equality. This paper intends to examine the effect of digital divide on educational system in the U.S. and China from a comparative perspective. This study adopts literature review as its research method. Types of digital divide that occurs in the two countries showcase some similarities, yet the factors attributing to the educational digital divide varies widely. Educational divide exists in different social groups. Systematic and cultural differences are the root behind these factors. In the U.S., digital divide occurred due to differences at multiple levels: race, state, schools, and family SES. In China, digital divide occurs due to geological divergence, generational division, and social class. The root Moreover, mitigating policies from the two countries illustrate how the U.S. and China access the issue from different perspective. The root behind such contrast is the difference in the two countries' social system and cultural attitudes. The two countries can inspire each other and the world in creating better solutions to solve this new form of education inequality.

Keywords: Digital divide, Education inequality, Policies, U.S., China.

1. Introduction

In an increasingly digital era, modern ICT (Information and Communication Technology) gradually shifted the way knowledge can be perceived. Distance education arose during this period, opening the possibility of learning that neglects the constraints of location and time [1]. While ICT opened new pathways and suggested new solutions to previous issues of education resource inequalities, it simultaneously created a new problem of the age: digital divide. Digital divide is the knowledge gap between people who can access ICT and people who cannot. Rather than simple disparities in devices accessibility, the divide may occur through connection to internet, digital ability, and quality of online access. As education continues to migrate to online platforms, particularly in the age of the COVID-19 pandemic, understanding digital divide's implications for educational inequality becomes crucial.

Educational inequality encompasses the disparities in educational access, resources, and outcomes among different social groups. It occurs in numerous ways, such as access to quality teachers, availability of advanced courses, amount of school funding, and extracurricular opportunities. Stepping away from school settings, equalities also exist in the household, where families with higher

socioeconomic status provides better educational tools, environments conducive to learning, and higher levels of parental involvement in education. Both school and household digital divide exacerbates these inequalities by creating additional barriers for students from disadvantaged backgrounds.

This paper can assess digital divide from three dimensions: physical divide, usage divide and quality-of-use divide. Physical divide examines the physical availability of devices, which includes ownership of smartphones, tablets, computers, and internet connections. Usage divide emphasizes the difference in skill and ability to navigate digital technology, such factor is commonly influenced by age, education, and previous exposure to technology. Quality-of-use divide extends from simple skills to the outcome of usage, it focuses on how individuals effectively use digital tools for meaningful activities with educational, professional, or civic purposes [2]. This work aims to discuss how access and usage divides impacts education inequality in this new age.

As the society turns toward distance education to achieve more accessible educational resources for all, individuals must also face digital divide. This paper focuses on comparing digital divide and its impact on educational inequality in the United States and China. These two countries provide a valuable context for this study due to their differing socioeconomic landscapes and educational systems. By examining the similarities and differences between countries, this research aims to offer insights that can inform policies to address digital inequities.

2.   Literature Review

Literature regarding digital divide and education inequality can be roughly categorized to two periods of time: before and during COVID-19 pandemic. Classifying the past research based on the occurrence of the pandemic because COVID-19 changed how digital education digital divide is assessed. Previously, digital education is a solution, a policy to promote education equality. Afterwards, digital education became a universal learning pathway for every student yet challenges still exists.

Before the occurrence of the pandemic, research viewed distance education as a tool to provide previously inaccessible educational resources to distant location or disadvantaged social groups. When education inequality is discussed at this period, researchers focus on the obstacles that hinders digital education to achieve its initial goal. Examining from a macro level, developing countries suffers primarily from the first type of digital divide [3]. Insufficient intrastation and internet connectivity hinders their ability to access online platforms and resources. On the other hand, with basic devices and connection equipped, developed countries are prone to the second and third type of digital divide. Within the country, digital divide occurs in two patterns: urban VS. rural geographical location, family socioeconomic status (SES) and school settings. Urban areas had better connectivity compared to rural areas [4]. And even with the same level of technology, studies claim that urban teachers exhibited higher levels of technology integration. Additionally, urban students showcase a higher preference for using technology in learning [5]. Regarding family SES, Students with higher socioeconomic status (SES) have higher digital competence and tends to use the internet for learning [6]. Moreover, Attewell highlights that parental involvement and home education are also crucial factors contributing to this divide [7]. Lastly, Research also examines how education setting perpetuates existing inequality through digital divide. Schools with higher funding for computers and internet have better-trained faculty team and more effective use of technology in education [8]. These schools are either private schools that receives direct investment or high-ranking public schools that receives more state fundings. Therefore, the tradition education gap between schools continue to widen in the digital age.

However, COVID-19 brought digital education to every household. Under this age, despite multiple levels of unpreparedness, schools transformed their classroom to a virtual setting. Research

during this period focuses on how different level of digital preparedness influenced education outcomes. Youth from working-class and racially minoritized backgrounds were disproportionately affected during the pandemic due to limited access to technology, less parental support, and inadequate learning environments at home. Gender also plays a crucial role in shaping online experiences. Females often bore the brunt of domestic responsibilities, affecting their ability to participate fully in online education [9]. The pandemic age enhanced effects of digital divide, creating additional mental stress and anxiety as students now face a previously unfamiliar learning method. Many students struggled to keep up with online learning due to barriers in accessing the necessary technological resources, such as reliable internet connections and suitable devices [10].

Despite significant research before and during the pandemic, several gaps remain that need to be addressed through post-COVID studies. With the pandemic coming to its end, it provides a valuable opportunity to study the current forms of digital divide within different society and its impact on education equality. Previous cross-national studies often draw the comparison based on the country's status of being a developed or developing country, lacking comparisons that focuses on their distinctive social environment. In addition, such studies usually include a wide range of nations, which limits their ability to zoom in and examine any country from a holistic perspective. Therefore, this work aims to compare U.S. and China, two highly characteristic countries in both social construct and the education systems, to obtain a deeper understanding of digital divide in the field of educational sociology. Studying digital divide in these two countries help scholars conclude different causes and examine following solutions. The exemplar of China and the United States can serve as an inspiration for future policies and research.

3. The Case Study of U.S.

3.1. An Overview of Digital Divide in Current U.S.

As early as 1996, the U.S. Department of Education released its first report of its NETP (National Educational Technology Plan), focusing on providing the necessary infrastructure for education in a digital age. Since then, the NETP reports are released on a 4-year basis, guiding U.S. on its way to achieve equitable digital education for all. In the latest NETP 2024 report, the Department of Education acknowledged the multifaceted issue of digital divide within the U.S. education setting [11]. The report summarized two existing types of digital divide in the U.S. society, however, they affect the population disproportionately.

The first type of digital divide is access divide, where some social groups are excluded from device or internet access. Such digital divide is common among minority groups: racial minority, SES minority, and disable groups. Even with a relatively high ICT household penetration rate of 74-86% [12] and 99.3% of schools with internet access [11], specific groups in America, still struggles from the primary form of digital divide. These disadvantaged groups continue to be marginalized and such inequality perpetuate. The second type of digital divide, the most common type in the U.S., is usage divide. Research demonstrates that there has been a wide gap in student's ability to utilize technological devices: some students can actively create, design, explore, and collaborate using these devices, while others are restricted to basic and repetitive tasks [11]. The first group of students will benefit through their development of creativity skill, logistic skill, critical thinking skill, and global awareness. This type of digital divide occurs due to a variety of reasons, including SES status, school resources, and parental education. Eliminating the secondary digital divide is key in mitigating the current ICT education inequality in the U.S.. Another type of digital divide that derives from usage divide is design divide, where educator's ability to obtain and apply digital resources makes a difference [11]. High-skilled educators can continuously develop their digital skill set, closely

keeping up with latest innovations, while low-skilled educators fail to improve. This type of divide can be attribute to school resources, faculty training programs, internal motivation.

Different type of digital divide exists among different social groups, it is rather impossible to discuss each of them in depth from a macro perspective. In the following section, the phenomenon of digital divide in education sector will be examined from multiple perspective, aiming to find the root of the problem.

3.2. Factors Contributing to the Digital Divides

This section intends to explore the different cause of digital divide in the U.S. from its characteristics within the education sector.

3.2.1. Racial Digital Divide

Racial inequality has been a long-discussed topic in the U.S., it is evident that such issue will appear in the education sector, especially with the emergence of digital education. The digital division among race remains in the first level, where individuals of racial minority lack available devices and internet connections. The U.S. Consensus Bureau reveals that 8.7% of their Black households rarely use their devices for learning, which is 4% more than the population mean. Even within the same demographic region, Black households are significantly behind their white neighbors in terms of digital access [13].

Even in the same school, similar pattern still exists. According to the American University, academic results for students without home internet access is lower than those who has access. And among the "have not" students, 27% are Native Indian Americans, 19% are Black, and 17% are Hispanic [14]. Students from marginalized racial communities are disproportionately affected by the digital divide, negatively impacting their academic performance. Such problem is not only prevalent among secondary education, a study of the UMES (University of Maryland Eastern Shore) illustrates the effect of digital racial disparities in higher education. The institution is known to serve first-generation, low-income, and minority learners, with 78% of African American students. Research discovered that a great number of students entering this University exhibit inadequate digital skill and literacy due to rare exposure to technologies, making learning in university more challenging [15].

3.2.2. State-level Digital Divide

In the U.S., the federal government and other federal agencies fund an estimate of 8% of education expenditures, while the rest expenses are provided by the states and their government [16]. State government revenue mainly comes from tax collected from individuals and local enterprises. Such system can be a pushing force of state-level education inequality. With richer states generating more tax revenue, a greater amount of money flow towards the education sector, allowing for more advanced learning devices and better training programs for teachers. For instance, the state of Massachusetts issued the Building Capacity for Effective Technology Integration grant that trains educators to apply EdTech in classrooms in 17 districts [17]. On the other side of the spectrum, poor states suffer from out-of-date technologies and low-quality human capitals. Therefore, on the state-level, digital divide occurs in both the primary and the secondary form.

Other than lacking sufficient funds for school digital infrastructure, poorer states also suffer from no available home internet access. The median household income of the five most affluent and the five least affluent states in the U.S. suggests that children in poor household living in less economically developed states are more prone to digital divide. Across the country, 4.3% of households with annual income less than $35,000 has no electronic devices dedicated for children's learning. Yet from the same income bracket, 6.3 % of households in the five poorest states struggle

from the same issue, while in the five richest states, the percentage drops to 1.6% [18]. The economic performance of the states extends its influence into the education sector.

3.2.3. Private VS. Public School Digital Divide

One uniqueness of the U.S.'s education system is its well-developed private school system. Different from public schools, private schools are independent of government funding, reducing the effect of limited state endowment on educational investment. The digital divide between private and public schools includes both access and usage divide.

In Phillips Academy (a $38,000-per-year private school), iPads has been given to each student, and many courses utilized online platforms during class time [19]. From a young age, students begin their interaction with the digital world, which help them develop digital literacy. Children not only acquire the basic skill sets of utilizing a digital device, but they also become creator of digital content through creativity-driven homework assignments. At the same time, faculty resources at private schools also exceed the public schools. Even though many private school teachers are experts within their field, with more advanced degrees and more training with latest technologies [20]. These teachers can provide better guidance for students navigating in a technology integrated classroom. With the advantages of sufficient funding and better faculty quality, private schools' students are more likely to gain from the digital age.

Public schools depend on state and local funding, which limits their ability to access advanced devices and to train their teachers. A "digital bind" exists within public schools, where digital usage for academic work is required, yet there is limited support and access to online resources. There is less opportunity to engage with digital devices and online platforms for public school students, hindering their chance to develop better digital literacy. As a result of the public school and private school digital education disparity, students' academic performance varies. For example, on the NAEP reading test 2022, private school grade 8 students received 20 points more than their public-school peers. Then, in the SAT, research found that private schools students continue to outperform public school students in various subjects. However, according to the National Center for Education Statistics, public schools are more attracting to American families then private schools [21]. This is due to the vast different in cost of public and private schools in the U.S.. The average private k-12 school's annual tuition in the U.S. is $12,350 [22], while public schools are free of tuition. Thus, there is a significant difference in student SES between the two school system.

3.2.4. Household Socioeconomic Status and Digital Divide

It is long claimed that household is an important education setting for children. Children's academic performance is highly correlated to the household's SES. Under the digital age, influence of SES disparities on children's education widened.

The primary level of digital divide (access divide) exists in families with lower income and families located in rural areas. In households with employed caregivers, 90% of children enjoy their devices and the internet for educational purposes, however, in an unemployed household, children that enjoys such access drop by 5% [18]. The correlation between family income and children's digital access is rather clear: with lower income, it is less likely to purchase additional or advance technological devices.

The second level of digital divide occur in families with low parental education level and families living in undesirable districts. 9.5% of respondents who failed to finish high school say that they rarely use their device for learning purpose at home, while only 1.2 percent reports similar pattern in households with at least a bachelor's degree [18]. It can be inferred that parents with higher education level are not only more digitally literate themselves, but they also prompt their children to use

technologies and the internet for more meaningful purposes. The environment of the household's district is also key to children's digital skill development. High ranking districts often benefits from surround enterprises that equip the community with more digital support and resources. A study of a district near Pittsburgh demonstrated a much higher level of technology integration among other district in the region through its partnership with Carnegie Mellon (the local university). The college helped developed computer science curriculum in local schools and better digital education training programs for teachers. A similar phenomenon is observed in schools around the Silicon Valley. According to EqOpTech, major corporations like Google provided every student with a Chromebook to use at home and in class, as well as technological support for academic success [13]. These high-ranking districts benefit from their community and provide a better digital environment for their students.

4. The Case Study of China

4.1. An Overview of Digital Divide In Current China

According to the "2021 National Research Report on Internet Usage by Minors", the amount of teenage internet users in China increased to 191 million, and its internet penetration rate reaching 96.8% [23]. With heightened level of internet access rate for primary and secondary schools, China is becoming the world's largest digital education market [24]. Unfortunately, despite a growing market, youth across the country still experience different level of digital divide.

The first level of digital divide still affects Chinese adolescents: current digital education infrastructure faces problem of low efficiency and suboptimal system. This is particularly true in underdeveloped educational regions. The secondary digital divide affects an even greater population, gradually decreasing students' interest in learning, trapping them in "information cocoons". Those students who have higher digital literacy benefit from digital devices, widening their motivation to explore digital content and widen their academic interest. Students who lack necessary digital skill are reluctant toward digital learning. Thus, the education disparity widens. Issues regarding digital education also occurs in the development of digital resources. The forms of digital resources available remains relatively uniform (primarily consisting of classroom recordings and MOOCs). With a lack of differentiated and categorized resources, platforms fail to meet the personalized needs of learners, diminishing interest among young learners. This issue is particularly pronounced in the field of special education [25]. Although the development of digital education occurred later than the U.S., China's growth within the field is outstanding. Yet such technological improvement unequally benefitted some social groups, while other suffers from a widened education gap.

4.2. Factors Contributing To the Digital Divides

This section will study the different cause of the digital divides in China by examining its characteristics within the education sector.

4.2.1. Urban VS. Rural

In the Chinese society, urban and rural educational digital divide exist in both its primary and secondary form. The access digital divide can be examined from school digital access and home digital access. According to CFPS (China Family Panel Studies), only 85.6% of rural households have internet access, and just 35.3% have a computer with internet access, meaning that two-thirds of rural households cannot participate in distance education [26]. This can be attribute to China's uneven regional economic development, resulting in many remote rural students suffering from poor educational infrastructure. Distance learning requires basic electronic equipment, which is an

additional burden for already impoverished rural families. Moreover, even when 69% of rural schools have access to computers and internet, concerns about paying electricity expenses and improper use often decrease student's actual access of devices [27].

Secondary digital divide occurs in rural regions due to two major factors: lack of training (among students and teachers) and outdated educational ideology. From urban schools with digital resources, almost all students reported having basic computer skills such as opening and closing the computer, typing Pinyin with the keyboard, and using educational software. Developing their digital skill even further, 90% of urban students report learning and understanding computer hardware. At the same time, 67-84% of rural students from schools with digital education have basic computer skills, 36% can use educational software, and 39% understand computer hardware. The limited amount of student training can partly account for such significant disparity. In urban settings, 100% of students from schools with digital access have computer classes (40 minute or more) at least once per week; on the other hand, in rural settings, only 72-78% of students from schools with digital access have weekly computer class [27]. Without adequate exposure technologies, rural students lag their urban peers in terms of digital competence. Severe shortage of teachers and professionals in the field of information technology among rural region also hinders education equality. University students with a teaching certification are less willing to work in economically under-developed areas, thus, rural schools struggle to attract and retain young teachers with modern digital understanding. Therefore, rural teachers generally have weak information technology skills. The shortage of teaching staff, with one teacher often having to teach multiple classes and subjects, leaves no additional time or energy to receive systematically digital training. Additionally, the issue of aging among rural teachers worsens the problem. A 2020 survey of 21,278 teachers across 31 provinces revealed that in rural areas, 8.8% of teachers is above 55 years old, while such population only accounts for 3.3% in urban areas. Thus, rural teachers are relatively incompetent in integrating digital education into their classrooms. Lastly, teachers from remote areas often adhere to traditional teaching styles, making it challenging for educators to adopt the "Internet Education" approach. Simultaneously, parents in rural areas overlook the positive impact of internet technology on their children's learning, rigidly believing that the internet will lead to addiction and be detrimental to their academic growth [26].

4.2.2. Generational Difference: Grandparents-raised VS. Parent-raised

There is a unique group of Chinese households vastly studied by education scholars: grandparents-parenting household. Research reviewed that there is a significant gap in education environment and outcome between grandparents-raised youth and parent-raised youth. Under the digital influence, the existing gap extends as grandparents-raised children are less digitally educated.

The digital divide between household with different generation parenting is mainly centered around usage divide. Lack of digital skills and literacy prohibit elderlies from utilizing online resources [28]. Older adults are prone to many obstacles when adopting and using digital technologies, which include personal attitudes, education level, income, and family support [29]. As a result, grandparents in the household often lacks the intention and the ability to use devices. Therefore, grandparents lack the ability to support their grandchildren's digital education [30]. Therefore, the channels for receiving educational content through become technologies narrows for grandparents-raised children, negatively impacting their digital awareness.

Differences in child-rearing values between grandparents and parents also worsens the digital education gap. For instance, grandparents favor traditional education methods, such as relying on physical textbooks and dictionaries for research and trumping memorization over application [31]. In addition, excessive pampering often occurs when grandparents are the primary caregiver. Children within these household are more likely to develop reliance on digital entertainments, and less likely to use their devices for educational purposes [26]. Ultimately, children in grandparent-raised

households tends to score lower on standardized tests and illustrate higher absentee rates in school [32].

4.2.3. SES and Digital Divide: The Great Middle Class

China has the largest middle-class cohort in the world, with a significant portion of its population falling within the middle-income group as defined by the National Bureau of Statistics. The middle class, particularly in urban areas like Beijing, Shanghai, and Guangdong, invests heavily in education to secure better opportunities for their children. The Chinese middle class places a strong emphasis on education and skills development to empower themselves and facilitate upward mobility [33]. As a modern extension of education investment, digital education is currently a rising focus for upper- and middle-class families in China.

According to research, Higher SES families prefer to invest in digital devices, which in turns improve children's educational performance [34]. Interestingly, the new middle class (annual incomes RMB 200,000 to RMB 600,000) exhibit an even higher willingness to make substantial financial sacrifices for their children's digital education. Over 15% of these parents are willing to allocate 30% to 50% of their annual income to secure better educational resources [35]. Children from these households enjoys a higher level of technology-integrated learning resources. The typical Chinese middle-class household is predominantly situated in highly urbanized cities, with parents who possess higher educational qualifications, which facilitate their continual learning and adaptability in the digital era. Furthermore, they demonstrate great interest in adopting the latest technologies and utilizing online educational resources to enhance their knowledge and skills. These parents are keen in raising their children to thrive under digital prevalence. They are not satisfied by basic level of digital literacy; they wish to raise their children with higher-order digital skills. Therefore, these households favor extracurriculars in STEM related subjects, specifically training student's digital competence. Courses in programming and robotics have become the most favored choice among parents. This number is even higher for parents with postgraduate or higher degrees [35]. The Chinese middle-class youth, therefore, are readily equipped with skills and mindsets corresponding to the digital era, compared to their peers.

5. Comparison situation and optimization strategies

5.1. Drawing the Comparison

In both China and the United States, educational digital divide exists mainly in the primary and secondary stage. These divides are influenced by socioeconomic status, geographic location, and educational resources. In both countries, the gap between urban and rural areas is pronounced, with students in urban centers enjoying greater access to high-speed internet, digital devices, and technologically enhanced learning environments compared to their rural counterparts. This disparity is exacerbated by economic inequalities, where affluent families can afford better resources, while low-income families struggle to provide basic digital tools for youngster's education. Additionally, the pandemic has highlighted these issues, with remote learning becoming a necessity and further exposing the technological and infrastructural deficiencies that hinder equitable educational opportunities. Both nations face the common challenge of bridging this digital divide to ensure all students receive a quality education, regardless of their geographic or socioeconomic status. However, differences between the two countries still exists within their system.

5.1.1. Education and Social system

Difference between U.S. and China occur in their varied social structure. From the very beginning of the U.S.'s history, people of different colors have been co-existing. However, varied SES among difference races posed challenges for equitable development. Low levels of SES and education attainment among racial minorities perpetuate across generations, making resources unevenly distributed. Racial divide is particularly outstanding in the education sector, with students of colors concentrated in under-developed educational institutions. As the society transform to a digital education era, the existing racial gap now continues to grow in a virtual setting. Black and Hispanic students not only limited digital access, but also the lack of opportunity to develop digital competence. On the other hand, with homogenous race among its population, digital divide does not occur racially. Even though the Chinese population consist of 56 ethnic groups, most of them are highly integrated, with the Han ethnic groups with the largest population. The majority of ethnic minorities does not differ much from the Han group in terms of SES, lifestyles, and social identity. However, ethnic groups from some of the distant provinces remain their traditional lifestyles, often rejecting modern technologies. For instance, level of digital access and digital education is notably lower among nomadic population in Xinjiang province and Inner Mongolia. Youth from these regions are more severely impacted by the digital divide.

The national education system within the two countries also varies from their roots. State-level divides also play a crucial role in the U.S., with poorer states struggling to provide up-to-date digital resources compared to wealthier states. Without much grant from the federal government, public schools in the U.S. rely on state and local fundings [16]. Therefore, the educational digital divide between rich and poor states exists. In the case of China, the central government lay out guidelines through the Ministry of Education, which state and local government must follow [36]. The more centralized finance of education in China promoted a rather even distribution of education resource across the country, comparing to the U.S.. Additionally, with the public-school sector fulfilling the needs of majorities, digital education resources are collectively managed by the government, allowing for reallocation based on each province's distinctive circumstance.

5.1.2. Cultural Attitudes

Another important distinction between the U.S. and China is variation in education expectations. Chinese households believes that education is the pathway to social mobility. During the past 40 years, many individuals were able to move up the social ladders through their attainment of higher education. Even though such pathway become is closing in recent years, the belief of still holds true, especially among middle class parents, who proved its success. Therefore, the motivation for accessing quality digital education prevail across households with different SES levels. The cultural value embedded in digital education explains the interesting phenomenon of middle-class households consuming a greater percentage of digital education resources. In the U.S., social classes have been relatively static in the past years. Families do not rely on education as a way to higher social class, thus, there are less investment in digital education. Moreover, higher education is seen as a personal choice rather than the "right" path. Therefore, it clarifies why the level of expense on technologies increases as household's SES increases. Families with lower SES are reluctant to spend their limited income on digital devices or resources, because they do not have the need to upgrade their SES circumstance through means of education.

5.2. Policy Responses and Initiatives

In every country, educational digital divide is a multifaceted issue with complicated cause, where existing inequalities magnifies through digital education. After the COVID era, digital education

became the new norm, every student will encounter online platforms and resources at some point of their education. Therefore, it is essential for us to solve digital divide in the education setting effectively and rapidly. Solutions varies for different countries based on their diverse social backgrounds; however, it is always valuable to obtain inspirations from others.

According to the Ministry of Education's "Overview of Work on Digital Education in China", the Chinese government has implemented a comprehensive strategy to address digital divide in education, highlighting the integration of digital resources, teacher training, regional equity, vocational education, and global cooperation [37]. A cornerstone of this strategy is the SEC (Smart Education of China) platform, launched in early 2022, which connects 519,000 educational institutions. In addition to providing extensive digital resources, the Ministry of Education has established "Standards on Teachers' Digital Literacy" and conducts regular capacity-building activities to ensure teachers are proficient in using digital tools. China also prioritizes regional educational equity through programs like the "MOOC Courses Going West" action plan, providing customized online courses to schools in western under-developed regions. Furthermore, China promotes global cooperation in digital education, sharing resources through initiatives such as the "Chinese MOOCs Going Global" project and engaging in international policy dialogue.

The United States also adopted a diverse range of policies, focusing on infrastructure development, affordability, usage, and design access. Key initiatives include the Learn Without Limits Initiative, announced by the FCC (Federal Communications Commission) in June 2023, which supports off-campus access to ensure students' engagement in learning outside of school. The U.S. Department of Agriculture's program plans to invest up to $1.15 billion to improve high-speed internet access in rural communities. The ACP (Affordable Connectivity Program), authorized in December 2021, reduces internet costs by up to $30 per month for households, making broadband more affordable. Additionally, community-based programs such as HCS EdConnect in Chattanooga open the public's access to free, high-speed internet. To address usage and design access, the DEER (Digital Equity Education Roundtables) Initiative engages community leaders to identify and address barriers to digital equity, while ongoing professional development and technical assistance support educators in integrating technology into their teaching practices [11].

While both countries aim to reduce the digital divide in education, their approaches differ significantly. China's strategy is characterized by centralized, comprehensive initiatives that integrate a wide range of digital resources and support various educational policies at all levels and regions. This holistic approach emphasizes regional equity and global cooperation, ensuring balanced access to quality education across the country and sharing resources internationally. In contrast, the U.S. approach is more decentralized, targeting specific aspects of the digital divide through infrastructure development, affordability initiatives, and community-based programs. The U.S. places significant emphasis on professional development and local engagement, addressing barriers to digital equity through community involvement and ongoing support for educators. With differing approaches, the two countries can learn from each other to achieve a better balance. China can benefit from more community-based programs and local engagement, which tailors to the specific needs of various communities. Conversely, the United States can gain from integrating digital resources across all education levels. The creation of a national platform like China's SEC could streamline the distribution of digital resources, ensuring more uniform access to quality education. Additionally, the U.S. could adopt China's proactive stance on global cooperation in digital education, contributing to and benefiting from international best practices and innovations.

6. Conclusions

In conclusion, this comparative study of digital divide's effect on educational inequality in the U.S. and China highlights the multifaceted nature of digital inequities. The COVID-19 pandemic brought

digital education to the forefront, exposing and exacerbating existing digital inequalities. In the U.S., working-class and racially minoritized students, as well as those with disabilities, faced significant challenges due to limited access to technology and supportive learning environments at home. Similarly, in China, rural students and those from lower socioeconomic backgrounds struggled with inadequate digital infrastructure and resources, further widening the educational gap. Examining the post-COVID era, the research emphasizes the need to address ongoing gaps. In the U.S., digital divides are often shaped by racial disparities and state-level economic inequalities, resulting in varied access to and usage of technology across different regions and schools. In China, the digital divide is influenced by urban-rural divides and generational differences in digital literacy and support, with middle-class families increasingly investing in digital education resources. Both nations have implemented diverse policies to mitigate these divides. The U.S. focuses on infrastructure development, affordability, and community-based programs, while China employs a centralized approach emphasizing regional equity, vocational education, and global cooperation. By learning from each other's strategies, both countries can enhance their efforts to bridge the digital divide, promoting more equitable educational opportunities in the digital age.

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