



Exploring the Impact of Digital Divide on Education Quality in Bihar

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Abstract

The Digital Divide represents a substantial barrier to the attainment of Sustainable Development Goal 4 (SDG 4), which aims to ensure inclusive and equal opportunities of getting education for all. Despite considerable technological progress, a huge number of people, especially in poor nations, remain without internet connection. According to the India Inequality Report 2022, the urban population is 7% to 8% more likely to own a computer than the rural population. From January to April 2018, 93.5% of respondents lacked a computer or laptop, increasing to 96.6% by the end of 2021, indicating a widening inequality post-Covid-19 pandemic. Merely one-fifth of the overall population have the skills needed to use a computer. Bihar exhibits the lowest internet penetration, succeeded by Chhattisgarh and Jharkhand, whilst Maharashtra demonstrates the greatest, followed by Goa and Kerala. As per National Telecommunications and Information Administration, USA in 1998, 28 percent of Americans residing in rural regions utilized the Internet, in contrast to 34 percent of individuals in metropolitan areas. Despite a significant general rise in Internet usage, a rural-urban disparity persisted in 2015, with 69 percent of rural inhabitants indicating Internet usage compared to 75 percent of urban inhabitants. A total of 120 questionnaire were distributed to a sample of undergraduate students across various disciplines, in which 102 responded. The data was gathered about internet access, device ownership, and the utilization of technology in education. The study examines socioeconomic, geographical, and technological disparities concerning the digital divide, arguing that these constraints exacerbate educational imbalances. Furthermore, the research explores how the COVID-19 pandemic increased this disparity through online education. The study enhances the current knowledge base by elucidating the digital gap and proposing strategies to mitigate this challenge in education.

Keywords: Sustainable Development Goal 4, digital divide, educational quality, online education, Bihar Education, impact of digital divide

Introduction

The world is swiftly undergoing a digital transformation. India has been advancing rapidly. However, the progress of digitalization has been uneven. A significant digital divide exists in the country, reflecting the prevailing socioeconomic disparities.

The advancement of digitization, however, has proved inequitable. A significant digital gap exists in the nation, reflecting the prevailing socioeconomic disparities. The digitally disconnected frequently belong to the most marginalized populations, which have been excluded from the advantages of digitization. The expanding "digital divide" may intensify disparities by obstructing underprivileged populations' access to fundamental services, like education, healthcare, and financial inclusion.

The pandemic made the digital realm an indispensable aspect of daily life for all individuals. Technology has facilitated the dissemination of knowledge and information, has made markets more accessible, and has enhanced access to essential services. This is only one aspect of the narrative—pertaining to the affluent individuals who own devices and consistent internet access at their residences and on their cell phones, enabling them to capitalize on the advantages of being online. The other perspective encompasses the marginalized—those who lack internet connectivity. This group of the technologically alienated is isolated from the advantages of this transformation and continues to lag farther behind. Technology and digitalization have advantaged the wealthy while

simultaneously contributing to inequities, hence creating a digital gap. (Oxfam India)

Literature Review

1. Conceptualising Digital Divide

In the mid-1990s, as the Internet gained popularity, it became evident that a significant obstacle was impeding boundless prospects. Computer specialists needed to devise a method to bridge the disparity between individuals lacking computer or Internet access and those who possess it, referred to as the digital divide. (Van Dijk, 2005)^[17]

The swift progression of digital technology has undeniably accelerated social development and enhanced human lives by offering a plethora of informational resources and services. The Digital Divide implies the inequalities among various groups in accessing and utilizing information and communication technology, particularly manifested in the availability of digital resources, competency in digital skills, and participation in digital activities. (Dijk, 2020)

This phenomenon highlighted societal disparity and impacted social advancement. The investigation of the digital gap had two phases. The initial phase evaluated the disparities in the allocation of digital resources, focusing on the "haves and have-nots" dilemma. The secondary stage examined the application of digital resources, focusing on the "use well" aspect. The extensive utilization of information and communication technology has altered the meaning and scope of the digital divide, incorporating

additional dimensions and levels. (Bustillos, J. 2017) ^[3]. The *Digital Divide* defines the disparity between those with sufficient access to information communication technology (ICT) and others with little or no access to ICT (Soomro *et al.*, 2020) ^[15].

Digital divide is a compound and multifaceted problem (Chang, Wong, & Park, 2014) ^[4]. It denotes the divide or gap between the subclasses of the population; the ones that enjoy adequate access to ICT, and the others that have 'zero' or poor access to computers, the Internet, and other digital devices. The issue of digital divide prevails, at least to some extent from very large to very small scale. It may contribute to the differences in rich and poor countries, rural and urban areas, men and women, competent and incompetent populations, and micro and macro-organizations. Hameed, 2007).

2. The digital divide and its societal implications

The Internet serves as essential for educating individuals about society, politics, business, and the environment. (Kim, 2009) ^[8]. People from differing foundations may significantly contribute to social advance by utilizing creating innovation to progress their career interests and individual lives. This requires that all people have advanced aptitudes and have viable access to a variety of data and communication innovations (ICTs). In any case, the difference in get to ICT avoids certain societal sections from locks in genuinely within the improvement of certain social qualities. The digital divide is a complex problem arising from inequalities in access to information and communication technology (ICT). Despite the acknowledged significance of ICT for economic development and welfare, facilitating sustainable growth in nations, study on these matters remains rather constrained. (Rooksby, 2008) ^[12]

Defining Quality Education

What is the definition of quality in the realm of education? A multitude of definitions for quality in education exists, reflecting the complexity and diverse character of the subject. The phrases efficiency, effectiveness, equity, and quality have frequently been employed interchangeably (Adams, 1993) ^[11]. A significant consensus exists about the fundamental elements of great education today. Quality education encompasses:

- Learners who are healthy, well-nourished, prepared to engage in learning, and supported by their families and communities.
- Environments that are conducive to health, safety, protection, and gender sensitivity, while offering sufficient resources and facilities.
- Content incorporated in pertinent curricula and resources for the development of fundamental abilities, particularly in reading, numeracy, life skills, and knowledge in domains such as gender, health, nutrition, HIV/AIDS prevention, and peace.
- Methods employed by skilled educators to implement child-centered teaching strategies in effectively

managed classrooms and schools, with proficient assessment, to enhance learning and mitigate inequities.

- Outcomes that include knowledge, skills, and attitudes, aligned with national educational objectives and constructive societal engagement.

3. Educationa Landscape of Bihar

The advancement of infrastructure is essential for the attainment of Sustainable Development Goals (SDGs) and the alleviation of poverty. The Government of India has periodically launched numerous rural development initiatives aimed at improving infrastructure. However, after seven decades of independence, there remains a significant deficiency in fundamental infrastructure within rural India, where approximately 70% of the population resides and contributes to food security. Bihar, India, has distinct higher education prospects and problems. Bihar has 8.9% of India's population, 89% of whom reside in rural regions, according to the Census. The geographical study shows that infrastructure and educational services are not evenly spread across the state. Bihar has high secondary education disparity, with girls in certain districts just half as likely as boys to attend.

4. Digital Divide in Education: Global and National Perspective

Digital technology has become a significant aspect of educational delivery and practice in several nations and contexts. A significant section of the global population is accustomed to mobile phone, internet usage, and other computer devices. Billions of privately-owned digital gadgets are regularly utilized, alongside billions more that are employed communally in public settings. Governments in almost every nation have implemented policy objectives aimed at promoting and facilitating the integration of digital technology in educational institutions, including schools, colleges, and universities. Digital technology is a subject of considerable importance to a worldwide educational audience.

5. The Significance of Education and Technology in a Globalised World

Education is more and more determined by global developments such as the international migration of students and teachers, standardised curricula and global testing such as TIMSS and PISA. In particular, higher education has been transformed by marketisation frames, International ranking systems, global research markets and digital learning platforms. This reform disrupts traditional education and practices advocating instead lifelong, adaptive, self-organized learning. The shift to a knowledge economy has also meant reduced emphasis on rote learning as skills such as problem-solving and networking take precedence. Virtual schools and others that offer 29hour a day, 7 day a

week support, are elevating competition to new heights locally, and we all must be prepared. The influence of globalization on higher education has undeniably transformed and continues to transform the academic environment. Universities are progressively more interconnected due to the proliferation of global research initiatives; international university rankings shape institutional objectives and priorities; global commerce affects publicly funded universities; and faculty and students can engage in teaching and learning through new globally networked methods. This evolving environment has compelled universities and colleges to reassess their fundamental purpose while ensuring their sustainability in the current global setting.

Objectives

1. To explore how digital access and literacy inequalities affect inclusive and equitable quality education for all (SDG 4).
2. To examine the use of ICTs to promote Sustainable Development Goal 4 by improving access to quality education

Research Questions

1. How Digital access and literacy inequalities affecting SDG 4?
2. How was ICT utilised to provide access to quality education in promoting SDG 4?

Research Method

Research methodology is a systematic approach to addressing the research topic. It may be defined as the scientific study of the methodology of research (Kothari, 2004). The research purpose is to examine the digital gap in education by analyzing students' access to and utilization of technology, as well as identifying the variables that contribute to this disparity. The study seeks to offer insights that can inform strategies and initiatives to solve the digital gap in education. A representative sample of 102 students was chosen to guarantee that the findings could be extrapolated to the larger student population. The sample frame comprised a combination of colleges from urban and rural regions to reflect regional disparities in the digital divide. The students were both from undergraduate and post graduate programs across government and private colleges and universities. Stratified random sampling method was used to ensure proportional representation from rural and urban regions of Bihar. The selection of students for survey was done using simple random sampling method to avoid bias in selection. A systematic questionnaire was created to gather quantitative data on many facets concerning access to and utilization of technology in education. The questionnaire encompassed demographic data, home internet accessibility, device ownership, technology utilization in educational settings, obstacles to access, and other pertinent criteria. The questionnaire was given using a combination of in-person and online questionnaires. The

sample comprises students from government and private colleges in the Patna (Urban) and Vaishali (Rural) district of Bihar. The sample size of 102 students yielded adequate data for research and enabled significant insights into the digital divide. The gathered data were examined utilizing suitable statistical techniques. The Data was collected using Questionnaire based Survey. A percentage analysis has been conducted to evaluate the outcomes.

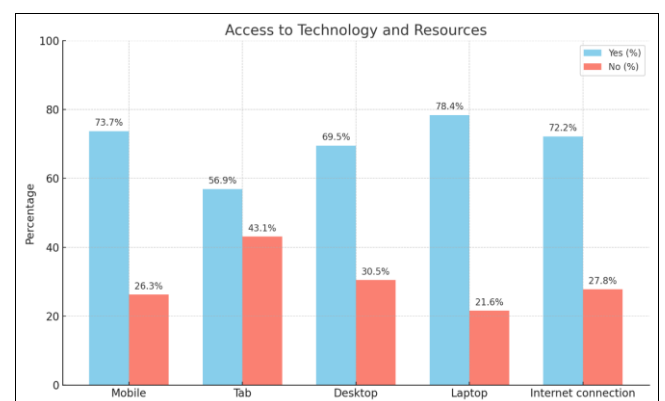
Results and Data Analysis

Numerous studies demonstrate that a student's socioeconomic situation significantly influences their educational achievement. The American Psychological Association (APA) defines socioeconomic status as encompassing income, educational achievement, financial stability, and subjective beliefs of social rank and class. It may include quality of life factors as well as the chances and advantages granted to individuals within society. It is widely recognized that children of parents with elevated and moderate socioeconomic status (SES) benefit from a more advantageous home learning environment due to the better availability of educational resources to these parents. Low family socioeconomic status is frequently correlated with subpar academic performance in children, however the processes that behind this association are less apparent. The study reveals obstacles hindering student's online education during the pandemic, including the educational background of parents of students,

Table 1: Availability and Access to Technology and Resources (Urban)

Access to technology and resources	Yes (%)	No (%)
Mobile	73.7	26.3
Tab	56.9	43.1
Desktop	69.5	30.5
Laptop	78.4	21.6
Internet connection	72.2	27.8

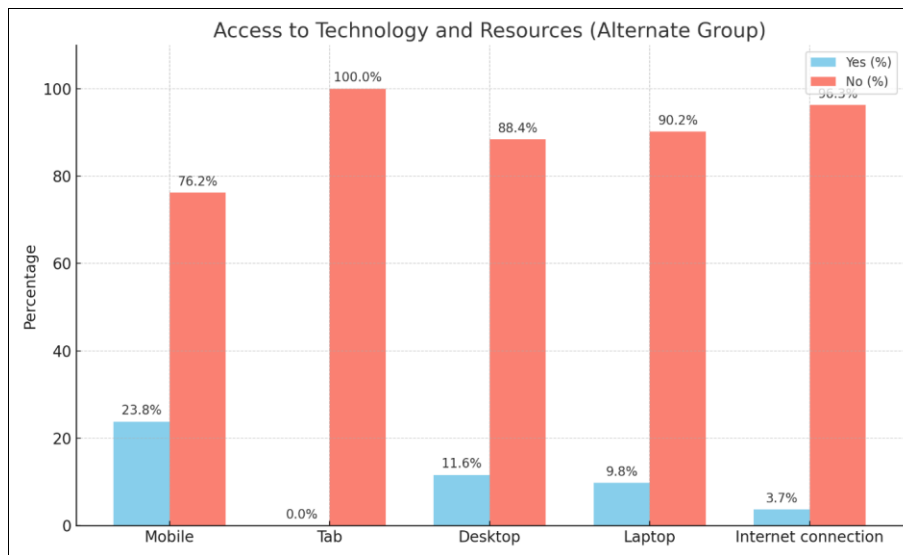
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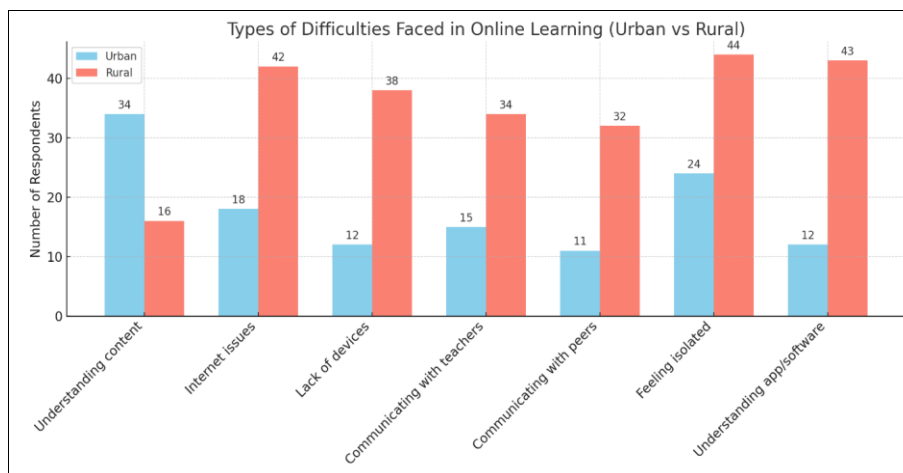
Rural

Access to technology and resources	Yes (%)	No (%)
Mobile	23.8	76.2
Tab	0	100
Desktop	11.6	88.4
Laptop	9.8	90.2
Internet connection	3.7	96.3

Fig 2:



Difficulties faced when shifted to online mode of learning during COVID 19 pandemic



Types of difficulties	Urban (51)	Rural (51)
Understanding the content delivered in the online class	34	16
Internet connectivity issue (breakdown-hourly, daily weekly)	18	42
Lack of access to necessary devices like computer, tab, mobile phone, shared mobile phone, data pack	12	38
Difficulty in communicating with teachers	15	34
Difficulty in communicating with peers	11	32
Feeling isolated or disconnected from the learning process	24	44
Difficulty in understanding the App/software	12	43

Conclusion

The term “digital divide” refers to the disparities that separate segments of society and nations into those who have and those who do not have digital access, skills, and knowledge, which lead to differences in digital use, opportunities, and benefits. Initially the phenomenon was thought of as a problem of access, i.e., the divide that separates those who have access to information and communications technologies (ICT) and those who do not. (Valdez,2021) [16]

The COVID-19 crisis transformed the global landscape and profoundly affected our daily lives in an unparalleled manner. Throughout the pandemic, technology facilitated the maintenance of a semblance of normalcy in our daily routines; nonetheless, several sectors, particularly education, saw disparities in access to assistance. Numerous states and

educational institutions choose online education as the exclusive method for the forthcoming academic session. Nonetheless, online education was unable to reach all students. (Sharma, J. 2023) [14]

Bihar’s digital divide poses a major challenge to achieving quality education for all in the state, especially considering (SDG 4). Social and economic inequalities, as well as human-made geographical diversity in the state, have limited the advantages of the internet for students in rural Bihar, particularly during the COVID-19 pandemic. For urban students, the study found an almost equal degree of digital access and use, although they are better equipped than their rural counterparts, including a better supply of smart devices as well as continuous internet access, apart from internet access issues for students who had economic stability.

The data indicates that the digital gap is pervasive, revealing a significant disparity in opportunities. Not all students received equitable access to schooling. Many presently enrolled students lacked access to a computer or tablet with internet connectivity. Even when a smartphone was accessible, it was often seen that a single device was shared throughout the entire family. Typically, male offspring were favoured, while female siblings were anticipated to acquiesce. It was observed that urban stations were superior to those in rural locations. Students from poor socio-economic backgrounds encountered challenges in obtaining online classes in both rural and metropolitan settings. The government undertook significant measures to guarantee that each student had an equal opportunity to learn. This raises an essential question: Are we ready to fully shift to virtual education? Do we have sufficient digital infrastructure? A plan for digital inclusion is crucial. We necessitate policies, investments, and technology that are more accessible and advantageous to every individual in our nation. We must eradicate structural barriers to the accessibility and application of technology. Digital equality requires that all individuals have access to information technology and may employ it for their own progress. Digital equity will enable individuals' engagement in the economy, democracy, and society. We seek more cost-effective internet services that address customer needs. To promote social advancement, all citizens must have access to high-quality technical support and digital literacy instruction.

Availability of data and material

The datasets generated during the current study are available from the corresponding author on reasonable request.

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