

Digital Divide in Bangladesh: A Constraint in Achieving SDGs

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Abstract

The digital divide is one of the significant concerns that hinders development, especially in developing economies, such as Bangladesh in this technology-centered era. The dimensions of the digital divide limit the achievement of the Sustainable Development Goals. This paper particularly focuses on how the existing digital divide impacts SDG 4 and SDG 8 and constrains the country's overall pathways towards achieving the SDGs within the timeframe. This paper also offers directions that could address the concerns over the digital divide. Overall, the paper highlights the importance of reducing the problem of the digital divide and calls for action that needs to be taken to smooth the paths towards achieving Sustainable Development Goals in Bangladesh.

Keywords: Digital divide, digital literacy, Sustainable Development Goals, education, economic growth.

1. Introduction

In the 21st century, digital technologies have become integral to driving global development. Numerous industries, including economic growth, education, healthcare, and social advancement, are profoundly impacted by digital technologies. Information and Communication Technology (ICT) plays a vital role in driving innovation, change, and sustainable development in this era (Radovanović, Holst, Belur, Srivastava, Hounbonon, Le Quentrec, ... & Noll, 2020). These technologies have revolutionized society's operation and individuals' access to opportunities for a better life. However, these also create societal disparities due to the prevailing inequalities. For developing countries, for example, digital technologies are considered both an opportunity and a challenge. While they offer the potential for rapid socio-economic transformation, there are significant differences between those who have access to the technologies and those who have not. The digital divide among large sections of the population presents a significant obstacle.

Digital divide can be defined from several perspectives. A vast deal of researches has defined digital divide based on their research focus. For instances, some define the term as have and have-not in terms of information while others have defined from economic view of information poor or information rich (Wresch, 1996). According to Webster, this dichotomous view undermines the nuances of the digital divide (Webster, 2014). The socio-economic background and geographical disparities contribute significantly to digital divide. OECD provided the most well-structured definition of digital divide which aligns with how this paper intend to define the term. OECD defines digital divide as *the disparity in access and usage of digital technologies, primarily internet access, across various socio-economic, geographic, and demographic groups* (OECD, 2001). The digital divide can be explained from two aspects: access to the internet, digital devices, and services, and digital literacy (Sparks, 2013). While having physical access to the internet and digital devices, availing of the service might still be hard due to the lack of digital literacy. Digital literacy in that sense, possesses significant importance as the digital access to avail services. The digital divide primarily affects individuals who, due to factors such as gender, socioeconomic status, location (urban or rural), and literacy levels, are unable to access or afford technology (Hargittai & Hinnant, 2008; Radovanović, Hogan, & Lalić, 2015). Many researchers have emphasized that this divide also reflects disparities in literacy and skills (Radovanović, 2015; Warschauer, 2002).

Internet access remains essential for sustainable development, and with foundational skills, more people could effectively use technology. In the context of the fourth industrial revolution, digital literacy is increasingly vital in governmental, economic, and educational domains, empowering individuals as work and daily life become more technology-dependent. Therefore, digital literacy is key to achieving sustainable development and is essential for reducing the digital divide. Nevertheless, over four billion individuals remain without access to fundamental digital public goods, such as the internet and crucial information regarding health and education. (Radovanović, Holst, Belur, Srivastava, Hounbonon, Le Quentrec, ... & Noll, 2020).

Bangladesh, a developing country faces significant challenges to cope with the global development dynamics as the country experiences a high rate of digital illiteracy. While the country has made considerable advances in the integration of ICTs, the country still grapples with the digital divide resulting from the lack of digital education. This gap in digital competence has profound implications for the country as it hinders the achievement of several Sustainable

Development Goals (SDGs). Among the key SDGs impacted by digital illiteracy are SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth). Education is one of the most significant areas in which digital illiteracy acts as a barrier to development. SDG 4 seeks to provide inclusive and equitable education and encourage opportunities for lifelong learning for everyone. Full and productive employment, decent work for all, and sustained, inclusive, and sustainable economic growth are the main objectives of SDG 8.

In this article, the focus is on these goals as these are intrinsically linked to the idea of inclusive growth and equal access to opportunities. Without digital literacy, individuals and communities cannot fully engage with modern educational tools, economic opportunities, or social platforms that drive progress. The failure to address the digital divide in Bangladesh undermines efforts to meet these SDGs and perpetuates cycles of poverty, inequality, and underdevelopment. This paper aims to explore how the lack of digital literacy hinders the country's path towards achieving sustainable development goals 4 and 8. Additionally, it emphasizes the need to focus on the digital divide to smooth the path towards achieving sustainable development goals.

The paper first provides an overview of the selected 2 SDGs followed by the current status of Bangladesh in terms of the digital divide and then provides a brief explanation of how the digital divide impacts achieving the SDGs. The paper concludes with the recommendations needed to tackle the digital divide problem in Bangladesh.

2. Overview of SDG 4 and SDG 8

In this technological-centered era, the achievement of the Sustainable Development Goals is widely driven by the sharing of knowledge and information. The United Nations (UN) also advocates for inclusive societies where all, regardless of socio-economic background and demography, have access to ICTs (Alam, & Forhad, 2023). Sustainable learning, in this context, involves educational strategies that support dynamic, lifelong learning by fostering knowledge creation and exchange within communities. Access to technology enables broader learning opportunities and helps bridge significant educational gaps, promoting a more sustainable and equitable educational system where everyone can benefit.

To achieve sustainability collectively, all the targets need to be met which makes achieving SDG goal 4 a critical step. As technology has become fundamental in modern life, incorporating technology into education has become essential. Consequently, ensuring equal access to education and substantial access to technology has also become crucial for overcoming educational inequality. Recognizing this, digital literacy is a crucial element in the Sustainable Development Goals (SDGs), with Target 4.4 focusing on increasing the proportion of youth and adults equipped with essential technical and vocational skills for decent employment. As part of Goal 4, indicator 4.4.2 calls for countries to monitor “the percentage of youth and adults who have attained at least a basic level of digital literacy (Shadat, Islam, Zahan, & Matin, 2020). As much as access to the internet and digital literacy is crucial for quality education, the role of these bears no less importance in economic growth. The economic impact of digital technology is growing rapidly. In 2014, the sector generated \$2.8 trillion in global GDP, surpassing the value of traditionally traded goods; by 2025 it is expected to reach \$11 trillion (Ingram, 2021). In developing countries like Bangladesh, Information and Communication Technologies (ICTs) play a pivotal role in the

economy, significantly contributing to poverty alleviation, generating employment opportunities, and fostering growth in other sectors of the country (Babar, 2017).

Table 1: Source-Department of Economic and Social Affairs of Sustainable Development, United Nations

Serial	Sub goal
4.1	Ensuring free, inclusive, and quality primary and secondary education for all.
4.2	Providing high-quality early childhood education and pre-primary care to prepare children for primary school.
4.3	Guarantying access to affordable, quality technical, vocational, and higher education, including university.
4.4	Increasing youth and adult skills for employment, decent work, and entrepreneurship.
4.5	Removing gender disparities and ensure equitable access to education and vocational training for vulnerable groups.
4.6	Achieve literacy and numeracy for all youth and a significant portion of adults.
4.7	Equipping all learners with skills for sustainable development, covering human rights, gender equality, peace, and cultural appreciation.
4.7 a	Developing safe, inclusive, and accessible learning facilities that are child-, disability-, and gender-friendly.
4.7b	Expanding global scholarships for students from developing nations, particularly LDCs, small island states, and African countries.
4.7c	Increase the number of qualified teachers in developing nations through international teacher training programs.

SDG goal 8.2 specifically focuses on technological advancement, innovation, and enhancing the productivity of the high-value-added sectors. This underscores the importance of digital literacy in driving economic growth supported by technological progress. Proficiency in digital skills is a key factor in enhancing productivity, which directly contributes to economic development. By equipping individuals with the technological expertise needed to perform efficiently in the modern economy, digital literacy enables countries to harness the potential of technology for GDP growth. The direct effect of technological skills falls on the GDP. Therefore, digital literacy contributes to achieving SDG goal 8 which plays a crucial part in a country's overall sustainable development plan.

Sustainable Development Report 2023 shows that while Bangladesh has shown moderate progress in some Sustainable Development Goals (SDGs), it faces considerable obstacles in fully achieving them. There has been no noticeable advancement in SDG 5, SDG 8, SDG 11, and raising serious concerns about meeting these targets by 2030. While SDG 4 and SDG 12 are currently on track, there are still notable challenges regarding universal education, skill development, and maintaining education quality in Bangladesh. The digital divide also contributes to these challenges (Sachs, Lafortune, Fuller, & Drumm, 2023).

3. Current Status of Bangladesh in terms of Digital Divide

As Bangladesh is yet to fulfill its commitment to Digital Bangladesh Vision 2021, the country has set Vision 2041 as a continuation (Bangladesh Planning Commission, 2020). One of the major aspects of the country's strategy to fulfill this vision is a 'leave no one behind' approach to ensure that the benefits of digitalization reach all tiers of society irrespective of other socio-economic and geographic factors (Bangladesh Planning Commission, 2020). However, as there is still a

persistent inequality in urban and rural areas of Bangladesh in terms of income and wealth accumulation and consumption, it has contributed to creating an apparent digital divide between these areas (Siddiquee & Islam, 2020). This division is a pressing challenge in achieving sustainable development goals, especially in attaining quality education for all and ensuring economic growth as it significantly narrows down the opportunities to take advantage of the benefits of digitalization.

Table 2: Source-Department of Economic and Social Affairs of Sustainable Development, United Nations

Serial	Goals
8.1	Supporting per capita economic growth with a 7% annual GDP target for least developed countries
8.2	Boosting productivity through diversification, technology, and innovation, focusing on high-value and labor-intensive sectors.
8.3	Promoting policies for job creation, entrepreneurship, and the growth of micro-, small-, and medium-sized enterprises, with better access to financial services.
8.4	Improving resource efficiency and decouple economic growth from environmental harm, following sustainable consumption and production frameworks.
8.5	Ensuring full employment and equal pay for all, including youth, women, and individuals with disabilities.
8.6	Reducing the proportion of youth not in employment, education, or training.
8.7	Eliminating forced labor, modern slavery, and child labor, aiming to end child labor by 2025.
8.8	Protecting labor rights and ensure safe working conditions, especially for migrants and women workers.
8.9	Developing sustainable tourism to create jobs and promote local culture and products.
8.10	Strengthening financial institutions to improve access to banking, insurance, and financial services for all.
8a	Increasing Aid for Trade support for developing countries, particularly least developed ones.
8b	Implementing a global youth employment strategy and adopt the ILO's Global Jobs Pact

According to the World Bank, 45% of individuals had internet access in 2023 in Bangladesh. The rate is significantly lower for women, as only 37.3% of the female population had internet access (World Bank). There is also a sharp difference between urban and rural areas of the country in terms of internet access. According to a report published in 2022 by Bangladesh Bureau of Statistics (BBS), 29.7% of rural households have internet access whereas the rate is 63.4% for the urban areas (Bangladesh Bureau of Statistics, 2023). The gap is also significant at second-level digital divides across various groups, which also contributes to marginalizing the groups with limited ICT knowledge (Siddiquee & Islam, 2020). Therefore, it is evident that there is significant inconsistency in different levels of society in leveraging the advantages of digitalization to meet sustainable development goals.

To understand the current status of the digital divide, it is important to analyze the four key areas of the vision of digital Bangladesh. These are the development of human resources, connection among the citizens, E-Government, and ICT in Business.

Human Resource Development: The focus on the development of human resources is on enhancing digital skills and incorporating ICT in education. There is a significant lack of digital resources in remote areas even though multimedia-based classrooms and e-learning platforms are emerging. The devastating impact of the digital divide in the education sector came to light

particularly during and post-COVID-19 years. According to the National Survey on Children's Education in Bangladesh 2021, only 18.7% of the students could participate in various remote learning initiatives (Bangladesh Bureau of Statistics, 2023). The same report reveals that 39.9% of students had no supportive device to access distance learning initiatives (Bangladesh Bureau of Statistics, 2023).

Therefore, it is evident that, during COVID-19 and the following years, students with limited access to facilities like the internet or television or any kind of digital devices, who already belong to marginalized groups, faced the most adverse impact of the pandemic-induced stagnation in education. There are also challenges of limited ICT skills among teachers. Higher education institutions are increasingly offering computer literacy and engineering courses, but access is primarily concentrated in urban areas, leaving rural communities behind (Sabur, 2019).

Connecting Citizens: The central focus is on ensuring digital access for all and expanding optical fiber networks and mobile phone-based services for agriculture, health, and legal issues. Sabur's research shows that high mobile phone adoption (90%), with 61% using smartphones, yet only 55% of smartphone users access the internet, primarily for social media, not broader internet browsing. High cost, unfamiliarity with content, and technical difficulties are significant barriers to Internet usage (Sabur, 2019).

Digital Government: To make services such as utility payments, healthcare, and education accessible online, especially to the poor and marginalized easily attainable efforts to improve e-government services have been made. Union Parishad complexes now offer multiple government services in a single location, though many are not familiar with these digital services. Currently, only 19% of users browse the internet, with most preferring social media (Sabur, 2019).

ICT in Business: Market access, ICT promotion, and the export potential of ICT services are the main goals of ICT expansion in the company. The number of freelancers is increasing; Bangladesh, which ranks second in the world, supports about 650,000 of them and makes \$100 million a year. However, the digital gap prevents more people from participating in ICT firms, particularly those from underrepresented groups who lack the means and technical know-how (Sabur, 2019). Despite the previous government's 'Zero Digital Divide' campaign (Dhaka Tribune, 2023), a significant divide among different groups in terms of access to both digital facilities and devices and skills persists. Therefore, considering the present scenario and the degree of the effect of the digital divide, this paper explores the impact of it on quality education and economic growth.

4. Impacts of Digital Divide on SDG 4 and SDG 8

4.1 Digital Divide and Impact on Education

According to Dale and Newman (2005), achieving universal development requires a multidimensional strategy incorporating elements from multiple disciplines beyond the borders of conventional education. Digital literacy can effectively be used to expand access to education for a wider range of students, especially those who previously faced barriers, across various socioeconomic and cultural settings. This can foster learning and equip students with the technical abilities essential for numerous professions (Budhedeo, 2016).

Geographical and Socioeconomic Disparities: The digital inequality in Bangladesh in terms of education puts a disproportionate burden on the students based on their geographical as well as socio-economic background. The COVID-19 pandemic exposed the significant gap in digital access and skills in Bangladesh. In the presence of the digital divide, the students of the country are not only derived on an international scale but also within themselves. A pointed out several factors that create a digital divide among students such as High Costs and Reliance on Mobile Data, Rural Network Infrastructure Deficiencies, Disparities Based on Geographic Location and Socioeconomic Status, and Increased Digital Distraction (Badiuzzaman, Rafiquzzaman, Rabby, & Rahman, 2021).

High Costs and Limited Network Infrastructure: The students in urban areas might have had access to digital tools such as laptops and smartphones, however, the students in rural or low-income areas lacked the necessary devices or internet connectivity. Furthermore, having access to digital tools did not ensure effective uses of the service as significant number of them faced challenges in navigating online platforms due to a lack of digital skills. This heavily interrupted education, particularly for marginalized students.

Challenges for Teachers and Institutions: The barriers caused by digital illiteracy also extend to teachers and educational institutions. A study by Fernando and Jain shows that teachers' lack of digital skills has hampered the quality of education and limited effective student engagement in the virtual classroom (Fernando, & Jain, 2022). The teachers struggle to incorporate technology into their teaching methods without adequate digital skills. It reduces the effectiveness of modern educational tools. Without proper digital literacy training for teachers, the problem exacerbates, as they remain underprepared to engage students in e-learning.

SDG 4 promotes equitable and inclusive quality education for all. The progress of achieving the SGD 4 becomes slow when a significant number of students are subjected to the digital divide. Without addressing the digital divide, achieving quality education for all and, by extension, other SDGs, remains a significant challenge. Therefore, to achieve SDG 4, Bangladesh must address digital illiteracy by investing in digital skills education for both students and teachers, ensuring equitable access to technology and learning resources.

4.2 Digital Divide and Impact on Economic Growth

Technology is an integral part of achieving economic growth. However, as mentioned digital divide creates an obstacle to economic advancement specially in the context of developing countries. Inadequate internet connectivity, low levels of digital literacy, and limited financial access in rural and underprivileged groups are some of the infrastructure issues that hinder Bangladesh's digital economy.

Rural-Urban Disparities: While digital adoption in urban centers has fostered job creation and efficiency in sectors like e-commerce, fintech, and remote work, rural areas, and low-income groups remain largely disconnected (Mani, 2024). For instance, while urban residents may benefit from online banking, mobile payments, and remote employment opportunities, individuals in rural

regions struggle to access these benefits due to both inadequate internet services and the lack of devices or financial literacy needed to navigate them.

Inadequate Connectivity and Digital Access: Despite substantial advancements in technology and growing internet use, a significant portion of the population still lacks the digital skills necessary to fully participate in and benefit from the digital economy (Zhu, 2023). In rural areas with limited access to education and internet resources, the digital divide is particularly pronounced. Teaching digital literacy is challenging within an outdated and under-resourced education system, and there is a shortage of qualified educators to provide this training (Bhuiyan, 2024).

Economic Barriers: Economic barriers further compound the problem, as many individuals and families cannot afford the devices or internet access necessary for digital learning. For low-income households, purchasing smartphones, computers, or reliable internet connections remains an unrealistic expense, severely limiting access to digital tools (Mani, 2024). This economic barrier prevents many from gaining exposure to and proficiency in technology, widening the digital divide.

Addressing the digital divide is critical for realizing the Sustainable Development Goals, particularly SDG 4 and SDG 8. The disparities in digital access and literacy hinder equitable education limit economic opportunities, and create barriers to inclusive growth and sustainable development. Therefore, in order to achieve the SDG targets within the timeframe, focusing on the digital divide should be one of the fundamental concerns.

5. Future Directions

To effectively address the digital divide and accelerate progress towards achieving the SDGs in Bangladesh, it is essential to implement a comprehensive strategy that targets both digital access and digital literacy. The following discussion focuses on the strategies that should be undertaken immediately-

Access to Internet and digital devices: The government and relevant stakeholders must ensure that uninterrupted Internet connectivity, affordable digital devices, and essential services are accessible to all, especially in rural and underserved areas. The cheap rate of internet should be introduced to bridge the gap between the socio-economic disparities. The digital tools essential for availing the services should also be affordable for those who lag behind. The first priority in reducing the digital divide, therefore, should be on ensuring access to essential digital services.

Digital Literacy Programs: Robust digital literacy programs should be introduced across the country, regardless the geographical location and socio-economic background for inclusive education that accommodates all. The students, teachers, professionals, and the general people should be incorporated into these training programs to build a digitally literate workforce. By investing in digital skills education and infrastructure, Bangladesh can overcome the barriers posed by the digital divide, and foster greater inclusion that enable citizens to fully participate in the digital economy. This will ultimately create a more equitable society, enhance economic growth, and contribute significantly to the realization of the Sustainable Development Goals.

Expanding inclusion of ICT in the curriculum: The government has already introduced the ICT in national curriculum. However, the effectiveness of this remains skeptical as a significant number of students lack the required digital skills. Therefore, the implementation of the curriculum is crucial to increase the digital skills among the students. In order to do that, the infrastructural development must become a priority. Without the proper digital infrastructure, educational institutions cannot ensure the effectiveness of the curriculum. The schools must be heavily equipped with digital devices along with highly trained teachers to ensure that the students benefit from the curriculum.

6. Conclusion

The paper underscores that the prevailing digital divide in Bangladesh contributes to delaying the path of achieving the SDGs. It also points out the nuances of the digital divide that impact the education sector and economic growth of the country. It highlights that without addressing the digital divide, the efforts to achieve sustainable growth would not be effective much. The country therefore must focus on reducing the existing gap of digital divide. The dual focus on access to uninterrupted internet, digital devices, and services along with digital literacy should be taken into consideration. The government, therefore, must focus across the country to ensure the inclusion of all regardless the gender, socio-economic background, and geographical location to solve the digital divide and smooth the pathways towards achieving Sustainable Development Goals.

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