Bridging the Digital Divide

An Analysis on India's Digital Initiatives

[1]Mettipally Navya Sri, [2]Niharika

[1]Assisstant Professor (Guest), [2]Assisstanr Professor (Guest),
[1]Department of Political Science,
[1]Indira Priyadarshini Govt. Degree College for Women, Nampally, Hyderabad, India
[1]navyasrimettipally@gmail.com, [2]jaiswalniharika@gmail.com,

***Abstract*—The twenty-first century is regarded as the Digital Era with Global pandemics like COVID-19 have brought technology and digitization to the attention of people worldwide. It has become important for students to build digital literacy skills for students as it empowers them to thrive in an era of rapid technological advancement by safely and effectively utilizing technology. With the rise of artificial intelligence (AI), this now includes AI literacy the ability to understand, evaluate, and use AI technologies responsibly. Digital literacy has been recognized by UNESCO (2011) where youth are more prepared to participate in the social, intellectual, economic, and cultural life of today and the future. The Indian government has launched several programs to raise the level of digital literacy. This paper discusses about the initiatives and schemes analytically. It shows programs such as Swayam, e-Patashala etc and challenges faced in rural areas. The Digital India initiatives seeks to expand internet access, promote digital literacy, and enhance e-governance.**

***Index Terms*—** *Digital Literacy, Swayam , Government Initiatives, Artificial Intelligence.*

I. Introduction

Literacy is commonly defined as reading and writing abilities that vary across different contexts constantly. Digital literacy refers to the ability to search, evaluate, compose information and do tasks through digital equipment and internet in study, work and social life. Digital literacy requires people to not only know how to find information on the internet but also how to assess sources and help them digest information that might be shown in various formats. The credit of introducing "digital literacy" goes to Paul Gilster in 1997 [1].

Digital literacy according to Paul is the capacity to understand information and use it on computers and the internet in a variety of ways technologies to communicate knowledge on digital platforms go beyond just being computer literate, claim Digital literacy has been officially recognized by UNESCO in 2011 which is intended to help people learn language of communication [2].

The American Library Association (ALA) defines digital literacy as "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills." [3].

II. Digital Literacy In India

In India digital literacy initiatives have been in place mid-1990s. With earlier attempts not been successful as expected with greater cohesion and interactions digital India initiatives launched on July 1, 2015. under the name of Umbrella program Digital India Mission was launched. The main purpose of this scheme is to transform India into a digitally empowered society and knowledge economy. Digital India Vision is centered on three key areas such as Digital Infrastructure as a Utility to Every Citizen Governance & Services on Demand [4].

Pillars of Digital India

Pillars of digital India which help India empower the society digitally empowered. a) Broadband Highways b) Mobile Connectivity to all c) Public Internet access programme d) e-Governance e) Information for all f) e-Kranti g) Electronics manufacturing h) Early harvest programmes I) Information technology jobs [5].

Digital empowerment of citizens in digitally empowered society and economy can be analyzed by NASSCOM (National Association of Software and Service Companies as follows [6].

a) The Indian smartphone market shipped 69 million smartphones in the first half of 2024, with 7.2% growth year-on-year
b) Indian startups raised a total of $30.4 billion in funding throughout 2024 despite global economic uncertainties.
c) UPI processed an impressive Rs 23.49 lakh crores across 16.58 billion financial transactions in October 2024
d) Millennials and Gen Z are the main contributors for social media usage in India. 52.3 %
e) The Indian gaming industry clocked $3.1 billion in FY23 and is set to hit $7.5 billion by FY28
f) As of 2023, rural internet penetration stood at only 37%. Also, India's digital literacy rate stands at approximately 37%,

III. Schemes On Digital Education By India

The government of India has launched various digital literacy missions inorder to achieve the goal of making a digital India. Few of such schemes/Initiatives can be seen below.

Pradhan Mantri Gramin Digital Saksharta Abhiyan

The Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) being initiated under Digital India Programme would cover 6 crore households in rural areas to make them digitally literate introduced in 2017.

Digitally illiterate individuals (14-60 years) in rural households, prioritizing non-smartphone users, Antyodaya households, and marginalized groups. The Government had implemented the National Digital Literacy Mission also known as the Digital Saksharta Abhiyan (DISHA) to impart IT training to 52.5 lakh persons, including Anganwadi and ASHA workers. It authorised ration dealers in all the States/UTs across the country so that the non-IT literate citizens are trained to become IT literate so as to enable them to

actively and effectively participate in the democratic and developmental proces. It in a way aim to enhance their livelihood. This scheme covers basic things such as digital device usage, internet browsing, communication, online government services, cashless transactions, and digital locker usage. These initiatives were helpful in making a significant progress.

According to NSSO Survey on Education 2014 only 6% of households had computers. It aims to address the vast digital illiteracy prevalent in rural India.

PM e-VIDYA

The PM e-VIDYA is a comprehensive initiative launched by the Ministry of Education. Its aim is to unify all efforts related to digital online, and on-air education. To enable multi-mode access to education. It was launched on 17 May, 2020. This program aims to benefit nearly 25 crore school going children across the country by offering educational resources through various platforms, including digital or online, TV, radio, community radio, and podcasts. This initiative itself is a huge step in promoting "Digital India".

Diverse Learning Platforms, Special Content for Divyang (CwSNs),One Class-One Channel Swayam: (Study Webs of Active-Learning for Young Aspiring Minds) is focused on higher education and lifelong learning developed through a collaborative effort led by the Ministry of Education, alongside NPTEL and IIT Madras, eventually supported by industry partners Google Inc. and Persistent Systems Ltd. It is India's own path to counter platforms like Coursera or edX. SWAYAM which is a free and tailored for Indian learners seeks to bridge the digital divide. Its aim is to bring those students who have remained outside of this digital revolution and have not been able to join the mainstream of the knowledge economy [8]. About 90,000 students have already enrolled in this facility by May 2020. It offers over 2,000 free courses in subjects ranging from computer science to the humanities. It Includes credit transfer options, allowing learners to use SWAYAM certifications in formal education. The portal hosts Massive Open Online Courses (MOOCs) to offer quality education on various subjects for students (from Class 9-12 to Under Graduates and Post Graduates) [7].

Swayam Prabha

Swayam Prabha is a digital Initiative in Education. It contains a group of 32 DTH channels dedicated to telecasting high-quality educational programmes 24×7 with a GSAT-15 satellite. It hosts new content daily for at least four hours and also gets repeated 5 more times in a day. In a way allows students to choose the time of their convenience [9].

E-Pathshala

It is developed by NCERT. In this platform digital textbooks, audio books, and videos across multiple language sare available. It can accessed in offline mode, which in a way ensures learning without depending on internet.

National Academic Depository

National Academic Depository (NAD) is an initiative by Ministry of Human Resource Development to provide a 24X7 online depository to Academic institutions to store and publish their academic awards. In order to help data available at doorstep.

DIKSHA

DIKSHA is a Digital Infrastructure for Knowledge Sharing. It has been formally launched by the Hon'ble Vice President of India on 5 September 2017. It is both built and maintained by the NCERT under the aegis of the Ministry of Education. It aims to deliver an open educational resources, large scale teacher professional development, analytics and a suite of interoperable digital services in 36 Indian languages. The platform was declared as "One Nation, One Digital Platform" for school education in May 2020 as part of the PM e-Vidya programme during the COVID-19 pandemic [10].

IV. Promotion Of Digital Literacy Schemes

During the years 2014 to 2016, Government of India had implemented two Schemes on providing digital literacy such as "National Digital Literacy Mission" and "Digital Saksharta Abhiyan (DISHA)" with a cumulative target of 52.50 lakh persons (one person from every eligible household) across the country including rural India. Under these two schemes, a total of 53.67 lakh beneficiaries were trained, out of which around 42% candidates were from rural India. Both schemes has been closed lately [11].

Bashini

BHASHINI means Bhasha Interfacee for India. It is an initiative under the National Language Translation Mission. It is aimed at bridging India's linguistic diversity through technology. It supports almost 35+ Indian languages, 1,600+ AI models, and 18 language services. It integrated into IRCTC, NPCI payments, and police helplines [12]. About 8.5 lakh+ app downloads have happened. Under Bharat Net Project which is one of the largest rural telecom projects in the world all Gram Panchayats (about 2.5 lakh) in the country are to be provided with broadband connectivity without discrimination. The project was approved by the Union Cabinet on October 25, 2011, and the Telecom Commission approved its three-step implementation on April 30, 2016 [13].

PM-WANI

The Government of India has launched the PM-WANI known as Prime Minister Wi-Fi Access Network Interface Scheme. This scheme aims to bring large-scale deployment of Wi-Fi hot spots throughout the country in order to increase connectivity options and improve digital access. The proliferation of broadband across country is an essential part of Digital India initiative [14]. Under PM-WANI about 3,33,300 public Wi-Fi hot spots have been installed till June 2025. It helps accelerate the internet access for citizens, including farmers [15].

The digital economy contributed 11.74% to national income in 2022–23 and is projected to rise to 13.42% by 2024–25. it is driven by advancements in artificial intelligence, cloud computing, and digital infrastructure. India ranks third globally in digitization. By 2030, the digital economy is expected to account for nearly one-fifth of overall GDP. These are the following advancements that have taken place in digital India initiatives such as [16].

a) mobile manufacturing units rose from just 2 in 2014–15 to 300 in 2024–25.

b) Telephone connections increased from 93.3 crore in 2014 to 120+ crore in 2025.

c) Mobile subscribers reached 116 crore 2025 with digital affordability increasing.

d) Internet connections saw a growth of 286% in 2025 in comparison to 2014.
e)Registrar General of India, about 97.65% villages are covered with mobile connectivity.
f) UPI transactions in 2025 saw a 32% growth from 2024.
g) India AI Mission launched in March 2024 with a budget of ₹10,371.92 crore to build a world-class AI ecosystem.

V. Advantages of Digital India Initiates

These initiatives helps a) Real-Time Assessment & Feedback b) Cost-Effective Education c) Breaking Geographical Barriers d) Increased Civic Engagement and Social Awareness e) Common Service Centers (CSCs)provide multimedia content, including e-governance services, education, health, tele-medicine, and entertainment, contributing to digital empowerment at the grassroots level. f) Improved healthcare and education services facilitates remote healthcare consultations, online education, access to e-learning resources, and tele-medicine services

VI. Challenges Ahead

Digital Divide

It refers to the gap between those with regular, effective access to digital technology and the internet, and those without this access. This digital divide between India's rural and urban areas during the lock down was highlighted in every sector. It was during lockdown the e-commerce, banking, e-governance became accessible As per NSO, most of the internet-enabled homes are located in cities, where 42% have internet access. In rural India, however, only 15% are connected to the internet.

Limited Digital Infrastructure

It is underprivileged in areas such as lack of necessary infrastructure, including computers, smart class apps, classrooms, and digital learning resources.

Lack of Awareness and Interest in Digital Technology

In India as per data available in 2023 only 29% of women are digitally literate, compared to 59% of males. This highlights the requirement for focused initiatives to encourage digital literacy among women. It is either due to lack of awareness or their disinteredt in this field.

Socioeconomic Disparities

Many people struggles to afford digital devices and internet connections, which restrict their ability to take part in digital literacy initiatives.

Insufficient Funds

It is very difficult for developing countries like India to develop the software and hard ware required to upgrade the digital technology.

Security

Cyber threat all over the globe and digital India will not be any exception. Hence we need a strong anti cyber crime team of about 1 million trained Cyber security professionals

VII. Conclusion

Digital literacy schemes and programmes in India such as PMGDISHA, NDLM, PM e-Vidya, DIKSHA, SWAYAM, and Swayam Prabha represent a major step towards creating an inclusive, digitally empowered society. These initiatives collectively aim to bridge the digital divide by providing accessible learning resources, building essential digital skills, and expanding educational opportunities to even the most remote regions.

By integrating technology into education, governance, and daily life, the government is enabling citizens to participate more effectively in the digital economy. While challenges like unequal internet access and low digital awareness still exist, these programmes have laid a strong foundation for a future where digital literacy becomes a universal and indispensable skill for personal growth, education, and national development.

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