



The binary Language to unbind digital literacy for illiterate

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Abstract

India is home to a growing population of over 1.25 billion people. Despite being one of the faster growing economies of the world, as much as 67 per cent of this population lives in rural parts of the country, spread across 650,000 villages which are represented by 250,000 villages councils (or panchayats) and about 3 million billion council members.

Largely an agrarian economy where the agricultural sector has been suffering for a few decades now for various reasons, official statistics mark about 21 per cent of the population living below the poverty line.¹ This means they're earning less than USD 2 a day.

While the national figures put India's literacy rate at close to 74 per cent,² functional literacy rates might be much lower given the potentially questionable measuring mechanism of this national data in today's time. Even so, the digital literacy rates are believed to be even lower in the country, given that the India's Internet penetration only stands at 40% of the population, even as mobile subscriptions crossed the one billion mark in June 2017.³ Further, when looked at from the gender lens, only 16 per cent of the country's female population has access to mobile Internet against 36 per cent of India's male population (mobile penetration stands at 80 per cent for men versus 59 per cent for women).⁴

This seems almost ironic for a country that boasts of being the world's second fastest growing mobile market (after China). In the times that we're living in—the times of “digital era”—connecting the community to the rest of the world though the Internet has become increasingly essential for any economy, for both social as well as development progress. Whole more and more global public and private services are transitioning online, the percentage of digitally literate persons in the country is not growing at the required rate.

The purpose of this paper is to illustrate a coming of age approach of imparting digital literacy to rural populations of the country, where traditional literacy is still lagging and where knowledge of English—a language that dominates the world of Internet both in terms of technology and content—is rare or weak. New Delhi-based non-profit organisation Digital Empowerment Foundation (DEF) has designed and developed START, a digital and media literacy learning curriculum and toolkit. This toolkit has been designed for first generation technology users living in rural, remote and tribal parts of the country.

The paper takes a long-term and meta-level view of literature and narratives from the ground that explore the journey of digital literacy for first generation technology learners.

Keywords: Digital Literacy; Connectivity; START, GOAL, Digital Toolkit; Rural India

1. <https://www.adb.org/countries/india/poverty>

2. <https://www.census2011.co.in/literacy.php>

3. <https://economictimes.indiatimes.com/tech/internet/internet-users-in-india-to-reach-627-million-in-2019-report/articleshow/68288868.cms?from=mdr>

4. <https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/02/GSMA-The-Mobile-Gender-Gap-Report-2019.pdf>

Defining Digital LITERACY

Deakin University's Graduate Learning Outcome 3 (DU GLO3) defines digital literacy as "using technologies to find, use and disseminate information"⁵. Paul Gilster, in his book, more simply defines digital literacy "literacy for a digital age"⁶.

(Lanham 1995: 200)⁷ further goes on to state that "digitally literate people are quick on their feet in moving from one kind of medium to another... know what kind of expression fit what kinds of knowledge and become skilled at presenting their information in the medium that their audience will find easiest to understand. It enables us to match the medium we use to the kind of information we are presenting and to the audience we are presenting it to."

Digital empowerment starts with access to the digital world and the opportunities it has to offer to the community. It includes the ability to engage with information and services online confidently, voluntarily, proactively, creatively and safely. It includes the ability to both consume as well as produce content online.

The term 'digital empowerment' must not be confused with the word 'digital inclusion' as the latter is limited to providing citizens with access to devices and networks while the former is an enabler for persons to a access necessary and timely information and services.

The INDIAN CONTEXT

Over the last few years, the government has taken several initiatives to improve the digital infrastructure and, subsequently, access to digital services in the country. These initiatives, which are in various stages of implementation, go beyond the availability of physical infrastructure but also addresses software and security infrastructure. Together, physical infrastructure, software capability and security

5. https://www.deakin.edu.au/_data/assets/pdf_file/0008/1237742/digital-literacy.pdf

6. A New Digital Literacy: A Conversation with Paul Gilster; <http://www.ascd.org/publications/educational-leadership/nov97/vol55/num03/A-New-Digital-Literacy@-A-Conversation-with-Paul-Gilster.aspx>

7. Lanham, R. (1995), Digital literacy. Scientific American 273 (3): 160–161.

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mechanisms are required to ensure the success of Digital India, a flagship programme of the Government of India launched in 2014. While certain government programmes also look at improving digital literacy in the country, digital literacy rates are still staggering in rural India where traditional or formal literacy levels are marked at only 71 per cent (urban literacy levels stand at 86 per cent). While there is a visible gap between rural and urban literacy rates, there is also a wide gap between male and female literacy levels. The adult literacy rate (15+) for male is 78.8 against 59.3 of females in 2011.⁸ While there is no denying that smartphone penetration and Internet user base has been steadily increasing over the last few years, digital literacy for many is often limited to making or receiving calls.

However, for Digital India to truly become a success and benefit the people of the country, besides, of course, reaching all sections of the society, improving digital literacy is imperative. However, the challenges to this are many, including the lack of knowledge of English language even among the literate but non-English speaking populations. With over representation of one language in the online space, there is now a visible overlap of digital literacy and English literacy.

Over the last one decade, the term 'digital literacy has come so popular and widespread that it is often taken for granted by those who are well integrated in the 21st century digital ecosystem, where all aspects of their daily

8. http://www.mospi.gov.in/sites/default/files/reports_and_publication/statistical_publication/social_statistics/Chapter_3.pdf

While ‘digital literacy’ ensured that all learners would have the ability to access the Internet to consume or produce content in a timely and relevant manner. ‘Media information literacy’ (MIL) referred to the ability to consciously and judiciously access, organise, analyse and utilise information. The transformative nature of the digital and MIL toolkit encouraged new learners to access the Internet responsibly, collaboratively and ethically.

life—professional or personal, social or leisure—are dependent on technology and/or the Internet. The discourse of moving beyond the ‘digital divide’ and towards ‘digital inclusion’ (hugely dominated by western authors) reflects the shared understanding of processes required for building a knowledge society where each citizen participates on digital platforms meaningfully.

With the mission to connect the unconnected regions of the country in an effort to empower those living in information darkness, Digital Empowerment Foundation (DEF) began projects that aimed at increasing access to the Internet as well as the rate of digital literacy among rural, remote and tribal communities in the country. However, over the period of its work, DEF realised that the regular—and even popular—tools and curricula on basic digital literacy were not the ideal solutions for such communities. This led to the conceptualisation and development of START, a digital and media information literacy toolkit for first generation technology users with little or no literacy.

Conceptualized from years of on-ground experience, the toolkit aimed to serve two purposes. While ‘digital literacy’ ensured that all learners would have the ability to access the Internet to consume or produce content in a timely and relevant manner. ‘Media information literacy’ (MIL) referred to the ability to consciously and judiciously access, organise, analyse and utilise information. The transformative nature of the digital and MIL toolkit encouraged new learners to access the Internet responsibly, collaboratively and ethically.

Designed for a peer-to-peer interactive learning approach, the toolkit incorporated methods of hands-on training, offline activities, reimagining of traditional games and group interactions to makes learning sessions more participatory and engaging for first-time digital learners.

A 60-year curriculum divided into six modules covering about 40 topics, the first five modules takes the learners through a journey of understanding

the differences between hardware and software; familiarising oneself with technology; operating the Microsoft Office Suite; operating a smartphone and social media platforms; understanding online safety and security measures; and leveraging the Internet for opportunities of education, livelihood and linkages with daily lives. The sixth module focuses on citizen awareness and dives into issues of stereotypes, biases, bullying and fake news, among others.

The digitally devoid education system

Under its ongoing ambitious programme called BharatNet (formally known as the National Optic Fibre Network) for proliferation of Internet infrastructure at the village council level, the government aims to connect all 250,000 village council with broadband connectivity. Far behind its deadline, the government claims to have only connected about 100,000 village councils. Availability of actual functional connectivity at even these villages councils, however, is questionable. Further, the larger 250,000 village councils encompass about 650,000 villages, that are far from being connected to the Internet. While the entry of new Internet Service Providers have increased mobile Internet penetration significantly, there are still millions of Indians who have been denied the right and entitlement to the digital infrastructure not just due to the lack of digital infrastructure but also due to the lack of digital literacy. Another challenge is the to the growth of a ‘Digital India’ is the shortage of skilled workforce. It is estimated that only 4.69 per cent of India’s workforce has undergone formal skill training as against 52 per cent in the US, 68 per cent in the UK, 75 per cent in Germany, 80 per cent in Japan, and 24 per cent in China.

In such a scenario, knowledge of computers and access to the Internet becomes even more critical



to pull them out of information darkness or enable access to their rights without the role of a middleperson. However, the country is not/has not been preparing the graduating population among the masses with the required digital skills.

Educators must understand that digital literacy is not a static concept but a dynamic one, with information communication technologies (ICT) continuously upgrading and evolving.

There are about 1.4 million government schools and 10 million teachers for over 227 million students enrolled⁹ in the country. That puts the average teacher student ratio to 32:1.

According to a World Bank study, based on unaccounted visits to 3,700 schools, 25 per cent of teachers were found absent from school and only about half were teaching¹⁰. These rates varied from number of absent teachers at 41.9 per cent in Jharkhand to 14.6 per cent in Maharashtra. The same report stated that teachers who don't show up to the work cost India is USD 1.5 billion a year.

This isn't the only challenge the Indian education system faces. According to the Montreal-based UNESCO Institute for Statistics and Global Education Monitoring study, 47 million students in India dropped out of school by tenth grade¹¹. There are various reasons, including the social and economic imbalance that exists in society, lack of proper infrastructure in government schools, and the

non-availability of teachers in schools. According to U-DISE (Unified District Information System for Education), India, of an initial enrolment of 100 students, on average, only 70 of them finish schools. While the number of students in the elementary education level is high (94) and many drop out during the secondary level with 75 left¹².

There is also the challenge of a relevant digital learning curriculum. In most schools, computer education is a weekly hour-long lesson. In many rural schools, there is often just one computer for a class of over 20 students. Unavailability of quality teachers, outdated curriculum and lack of integration of digital education with mainstream education are some of the other issues that hinder India's digital growth.

Like urban private schools, if government schools would mainstream smart classes and digital labs, students and teachers will be able to access quality teaching and learning resources, no longer restricted to their textbooks alone, potentially leading to higher student motivation to attend classes.

The paradox, however, is that even as India serves as IT hub to the rest of the world, it has also been criticised for a wide digital divide, according to Kapoor and Mathur (2016)¹³. The solution to overcoming this barrier lies in both the availability of digital infrastructure and the capability to access the Internet in a timely and relevant manner.

9. Brand India. (2017, April). Retrieved from <http://bit.ly/2pjHdkV>

10. Teacher Absence in India: A Snapshot. (2014). Journal of the European Economic Association. Retrieved from <http://bit.ly/2pfVvCb>

11. <http://uis.unesco.org/sites/default/files/documents/ip35-estimation-numbers-rates-out-of-school-children-adolescents-household-2017-en.pdf>

12. <http://udise.in/udise.html>

13. Kapoor, Amit and Mathur, Deepti. 2016. "Bridging the Digital Divide", The Hindu, July 28, 2016, Available at: <http://www.thehindu.com/opinion/op-ed/bridging-the-digital-divide/article8907625.ece>

An integrated approach to digital literacy

Though quality digital education and its integration into mainstream education is still behind expectations at the school level, the Government of India must be credited for envisioning the National Digital Literacy Mission (NDLM) under the umbrella of the Digital India programme¹⁴ in 2014. In 2017, Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) was rolled out, aiming to make 60 million rural persons digitally literate by March 2019. The budget allocated for this programme was marked at over USD 360.7 million, however, implementing partners have been criticised for focusing more on achieving target numbers than the quality of training, subsequently negotiating with the vision of the larger initiative.

Policy makers and implementation stakeholders must understand that the concept of digital literacy is not limited to the training of using computer or smartphones but needs a more holistic approach to enable people to leverage digital tools in their daily lives, seamlessly, and thus improve their lives.

START toolkit has been designed for persons who may or may not be traditionally literate, and may only rely on oral communication due to lack of knowledge of a script.

The other point to take into consideration while rolling out an initiative such as the NDLM is to take an institutional approach to teaching and learning. Instead of providing digital literacy trainings to 60 million random individuals, the government could have taken an institutional approach to create a ripple effect of digital literacy. By targeting school teachers, village council representatives, frontline health workers and grassroots civil society organisations, among others, the digital literacy trainings would have also reached out to those to whom these groups serve. For example,

village council representatives could have used their learning to bring in efficiency, transparency and accountability into their governance-delivery system and in the knowledge dissemination practices. This would not only have created a pool of digitally literate individuals and institutions, but also incentivise the adoption of digital tools and technology among community members, thus creating a cascading effect.

Using binary language to impart digital literacy

Ideally, digital literacy opens up the door for two-way communication. However, the approach to imparting digital literacy has limited the learning to understanding basic features of a computer or a smartphone. Several organisations and institutions engaged in delivering such training are still using the old school way of teaching, many even rely on theoretical knowledge over practical knowledge. Moreover, most of these curricula—even for basic computer literacy—is designed by western technology experts, in languages more familiar to the Western audiences, to use technologies designed in the West.

Given the low literacy rates in rural India and lack of penetration of more advanced technology in every day rural lives, reliance on theory-based training approach is not the right way to go in the first place. Secondly, such training modules are only efficient enough to train rural populations to learn computer and the basic applications, but not really enable them to exercise these skills in their daily lives. Thus, the new digital adopted become mere consumers of information, leaving the purpose of ‘digital literacy’ and ‘digital empowering’ unfulfilled.

This was a learning for DEF, too, who largely relied on basic digital literacy courses designed by the top technology companies of the world. The results were low retention of technological understanding, higher drop out due to difficulty in understanding the subject, and lack of integration of technology in the daily lives of people.

Fourteen years experience of working in rural regions of the country, DEF realised that there is a need to design a curriculum for the rural and tribal community in a way they would feel more comfortable engaging with. So, sign languages, use of colors, audio-visual resources, non-script language and hands-on approach. The result of this realisation led to the designing of START. In 2016, DEF designed a special curriculum and toolkit called START, a

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digital learning and Media & Information Literacy (MIL) toolkit, to meet the digital learning needs of the oral communities through a pedagogy that focuses on an offline and non-digital approach to learning digital technologies.

START toolkit has been designed for persons who may or may not be traditionally literate, and may only rely on oral communication due to lack of knowledge of a script. This toolkit included interactive memory games to learn about parts of a computer; ‘Find The Odd One Out’ card game to familiarise oneself with functions of computer; crossword puzzles to revise practical knowledge; ‘Find The Pair’ to learn about computer applications; a reimagined ‘Snakes and Ladder’ board game to learn about online safety and security; and ‘Role Play’ to learn about ethical communication and journalism; among others. In their first lessons, students are asked to draw parts of a computer on a chart paper before they actually go on to touch one to beat their fear of technology. They also plan social campaigns on banners to learn how they can be translated on social media platforms. This approach familiarises them with technology lest they ask, “Will I get an electric shock if I touch it?” or “I am scared I’ll break the laptop if I press the wrong key.” So while it’s important to learn how to spot and verify misinformation, it is also crucial to know what phishing looks like so that they don’t believe that a Nigerian prince will hand over the promised money.

According to IAMAI report¹⁵ India had reached 500 million internet users in December 2018. This number is set to reach 627 million by end 2019. Buoyed by increased Internet penetration in rural and urban areas and the ubiquity of inexpensive mobile devices, this number is sure to keep rising. The Asia Pacific alone accounts for 51 per cent of global Internet users already. As the number of Internet users rise in the world, so, too, will the vulnerabilities brought on by the use of technology and its more unsavoury effects. It cannot be denied that the online space has transformed into a public space. Facebook and Twitter have become places where people make friends and

socialise, e-commerce websites compete with the humble *kiranawala*, Instagram has replaced holiday albums, WhatsApp has changed how people communicate, and there are a number of educational apps to supplement learning today. Our online or virtual lives are so intertwined with the everyday, tangible world that there is little need to make a distinction between the two anymore. Then there is the cloak of anonymity, which comes with its own positives and negatives. With a push from the government and private players to switch to cashless or digital processes, our interactions online are bound to grow in leaps and bounds in the years to come. ASSOCHAM reports about 100 million consumers made online purchases in 2017 and the number is expected to cross 120 million by 2020 with the rise of digital natives, better infrastructure in terms of logistics, broadband and Internet-ready devices to fuel the demand in e-commerce (when more than half of India’s population is not even online).¹⁶ At the same time, cybercrime cases have seen a spike — data from the National Crime Record Bureau shows that cybercrime have risen 6.3 per cent from 11,592 reported crimes in 2015 to 12,317 in 2016. Gender-based crime alone is high. A study by Norton by Symantec has found out that 41 per cent of women has faced sexual harassment online.

As DEF strived towards enabling rural communities to adopt digital tools to harness the opportunities the Internet has to offer, it realised that these efforts would be incomplete if digital literacy skills were not combined with media and information literacy (MIL). It was important for the organisation to equip them with the sensibilities to access, understand and critically analyse information. This realisation become stronger with the growing instances of cyber crimes, online harassment, stereotypes, hate messages, fake news and more, the impact of which was more visible in the last couple of years than ever before.

And so, DEF decided that it will no longer only be responsible for bringing the offline communities online with digital education but that it also had

15. IAMAI - IMRB report https://imrbint.com/images/common/ICUBE™_2019_Highlights.pdf

16. <https://economictimes.indiatimes.com/industry/services/retail/online-retail-consumers-to-cross-100-million-by-2017-assochem-resurgent-india-study/articleshow/56417797.cms?from=mdr>

the responsibility of keeping them safe online as well as ensuring they do not make anyone else feel unsafe due to their digital presence and freedom of expression. Thus, it was time to expand the START digital literacy toolkit to become a digital and media information literacy toolkit. It now included a modified version of snakes and ladders to understand online security and safety, a hands-on module on how to spot and verify misinformation, and various activities to create conscious producers of content online.

A 60-year-old folk musician from Rajasthan is not literate enough to even write his name but he now uses his smartphone to record songs and, subsequently, create a digital archive of his culture, tradition, art, geography, history and language through his voice. “My brain can store over 500 songs, can your memory card do the same?” he had asked on his first day of START training.

DEF, an organisation that works in more than 500 villages across 23 Indian states, uses leverages several existing and upcoming projects and programmes—funded by various partners—to roll out START. One of these projects under its Education programme is GOAL.

Going Online As Leaders or GOAL, a collaboration of DEF and Facebook India institutionally supported by NITI Aayog, is an urban-rural mentoring programmes that creates teaching and learning links between urban exposed women and rural underexposed women. Through GOAL, DEF endeavours to provide digital education in the rural and tribal communities where females are deprived of digital education, and help them become confident individuals through their connections with urban women who, too, have met their share of struggles to be where they are today. As a part of the project, young girls are trained

in functional digital literacy and mobile literacy; equipped with basic digital tools; and nurtured to inculcate life skills, leadership qualities, advocacy skills and entrepreneurial attitude. During the six-month training and mentorship programme, urban women leaders, with expertise in their respective domains—from business, education and health to politics, arts and entrepreneurship—inspire, guide and encourage at five tribal girls each to become village-level digital young leaders. In its pilot stage, 40 girls were engaged within Betul district of Madhya Pradesh, a tribal region. The programme is now in its first phase across five states—West Bengal, Madhya Pradesh, Jharkhand, Odisha and Maharashtra—where 50 mentors will train 200 mentees in life skills while DEF trains them in digital literacy through START.

Conclusion

Programmes like START and GOAL aim to not only improve digital skills but also build confidence among learners to improve their ability to navigate the Internet safely and in a meaningful way, utilising technology in their workplace, accessing government services delivered electronically, participating in telemedicine applications, or accessing online educational opportunities. These kind of community-oriented skilling programmes enable first-generation learners to have greater access to education, health, information services, thus improving their lives.

Going forward, combining digital literacy with elements of media information literacy from the early age of a student’s life would transform the digital education system and prepare a youth for the future generation. If both government and private sector join hands with such community-oriented initiatives, it will create 53 million livelihoods by 2021, assuming a job to user ratio in India of 1:10 and local language Internet user population of 536 million by 2021.



About the author

As a technologist, Ms. Ritu Srivastava have successfully leveraged my understanding of technology in the development sector specifically the Information, Communication and Technology (ICT) domain, using digital technology towards sustainable development of underprivileged communities / marginalized sections of society. She has 14+ years of experience in working with social sector, specifically focusing on collecting ground experience. Ms. Ritu interest lies in areas of broadband policies, gender & access, gender and internet governance, violence against women, open spectrum policies and community development. Ms. Ritu holds Masters degree in Electronics & Telecommunication.