ADOPTING TECHNOLOGY

FOR IMPROVING ADULT LITERACY

A Policy Paper by Wadhwani Institute of Technology & Policy

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Table of Contents

Executive Summary

Adult literacy has evolved in India from basic literacy (reading-writing-arithmetic capability) during pre-independence to a holistic approach of lifelong learning.

The literacy rate in India, as per 2011 Census, has reached 74.04 %, which reflects that there is still a large segment of population (~25 Crores) in 15+ age group which remains illiterate. This has substantial impact on national development. The government has over time implemented various programmes to improve adult literacy in the country with varying success. Programmes like Sakshar Bharat Mission have been able to impact more than 7.64 crore illiterate people, however, the continuity of outcomes and lifelong aspect of learning still requires adequate measures.

The new adult literacy initiative is taking shape to eradicate illiteracy. Factors like the geographical spread of illiteracy, gender disparity, learner diversity, lack of mobilization, and limited financial resources needs to be accounted for and addressed in order to achieve better literacy levels. This paper contours the landscape of adult literacy in India, to identify how technology can be leveraged as a solution to address challenges in the delivery of adult literacy programs including the learning content, training of educators and monitoring and evaluation of the adult literacy program. It also provides an extensive, though not exhaustive compilation of domestic and international examples where technology has been used in adult literacy.

Census Wise Illiteracy Trend (1951-2011)
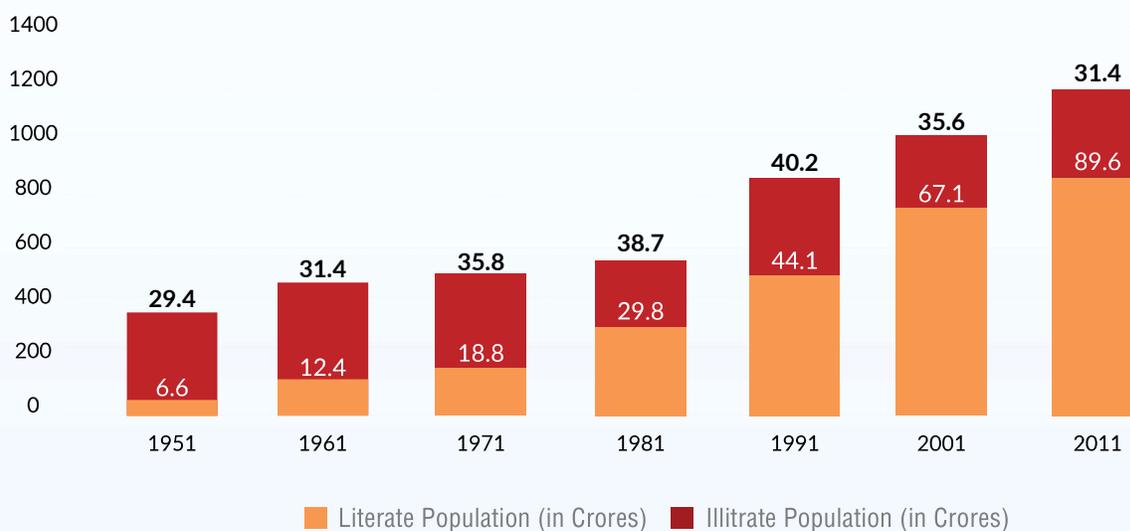
Figure A : Computed and Reproduced from Census Figures for Total Literate and Illiterate People in the country.[a,b,c,d]

[a]https://archive.pib.gov.in/archive/releases98/lyr2003/rsep2003/06092003/r060920031.html
[b]https://www.indiabudget.gov.in/budget_archive/es2006-07/chapt2007/tab97.pdf
[c]https://www.indiabudget.gov.in/budget_archive/es2001-02/chapt2002/chap107.pdf
[d]https://pib.gov.in/newsite/PrintRelease.aspx?relid=71383

Recommendations

It is recommended that the government can have targeted literacy drives in the identified ~20% districts where 60% of the illiterate population resides, with special drives for female literacy in states with high female to male illiteracy gaps such as Rajasthan, Gujarat, Odisha, Tamil Nadu and Maharashtra.

An online platform for Adult Literacy Programme delivery and monitoring should be developed which enrolls and tracks adult illiterate population throughout the life cycle of becoming literate.

With regards to training, an online Artificial Intelligence (AI) based training system may be put in place to monitor engagement level, provide tailored feedback, evaluation and certification of volunteer as an instructor. With regards to volunteer training programme, Virtual Reality (VR) should be used for simulated and immersive training of volunteers as they vary in training capacity, age and experience. AI based customized content to cater to the needs, interests and learning levels of participants needs to be created. Mobile app for delivering lessons through mobile phones to ensure wider reach of content with flexibility to the learner should be developed. In terms of monitoring and evaluation, it is recommended that literacy levels should be monitored via a mobile app through multi-level awareness and information processing tests in a gamified manner as it improves problem solving and critical life skills in real world.

Also, a demand based guaranteed literacy scheme for adult illiterates should be introduced. The technology could also be used to nudge learners to cultivate habits and attitude for learning. A combination of all these measures shall help India to bring down the illiteracy rate and help in building an educated society which can contribute to this growing economy.
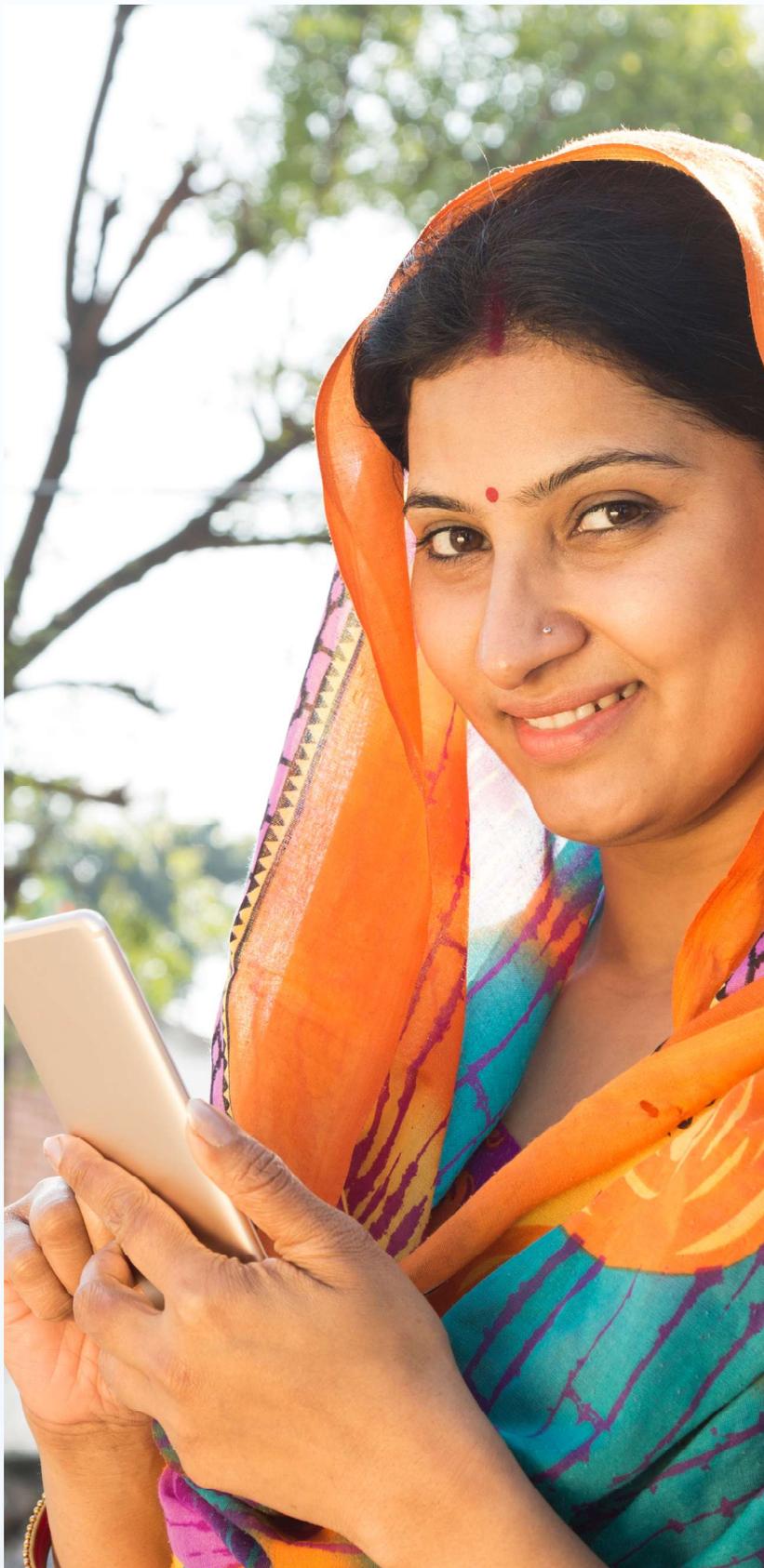
Table 2

Initiative Details	Salient Features
Same Language Subtitling (SLS)– IIM-Ahmedabad+ PlanetRead	It leverages existing mass media platform and subtitling the audio-visual content in the language of audio track in sync. Regular SLS exposure achieves three things at scale: 1) assured reading skill practice and improvement, 2) language learning, and 3) media access among the Deaf and Hard of Hearing (DHH).
Computer Based Functional Literacy (CBFL) Programme – Tata Consultancy Services	CBFL Programme uses multimedia to strengthen adult literacy. It comprises of a multimedia software package and e-Learning system that helps to learn basic reading, writing and arithmetic. The technological mode was opted to eliminate challenges in traditional teaching methodology. It benefitted 15 States in India and Burkina Faso in Africa. In 2000-09, the CBFL-based ALP programme reached more than 1,20,000 people. [21]
Tara Akshar Plus – Development Alternatives	An NLM-accredited initiative that aims to impart foundational literacy to rural and peri-urban women. The program is operationalized through a computer software and takes support of an instructor to impart instructions. It empowers its students by creating awareness about basic healthcare, legal rights and laws, ways they can contribute to the economy and generate income opportunity.[22] As on December 31, 2020, the program had reached around 2,48,000+ women in 1900+ villages in 11 states in northern India.[23]
Adult Literacy Program for Women – BSES – Reliance Group	The CSR funded programme is carried out in Mahila Shiksha Kendras to empower women to read and write through a six-month computer-based functional literacy course. It has reached approx. 54,097 beneficiaries.[24]
Adult Literacy & Continuing Education Program – Vikas Shiksha Samiti	The program aims at achieving total literacy for the age group of 15-45 years to achieve transformation in rural areas. It runs for 8 months and takes place in three phases. After a village achieves 100% literacy, a 'Life Skills and Livelihood Skills Training Center' is set up to reinforce the learning of newly literates and to provide them with access to facilities for lifelong learning opportunities.[25] The program has covered 167 villages in various phases and has around 47,500 beneficiaries.[26]

[21]https://g01.tcsion.com/dotcom/ALP/Downloads/CSR_Casestudy_Computer_Based_Functional_Literacy_08_09.pdf
[22]https://taraakshar.org/abouttaraakshar
[23]https://taraakshar.org/quantativeimpact
[24]https://www.bsesdelhi.com/documents/73527/2497782/Press_Release_09Oct18-Eng.pdf
[25]https://www.vssgroups.org/adult-literacy-and-continuing-education/
[26]https://www.vssgroups.org/adult-literacy-and-continuing-education/

Recommendations on components of training, teaching, monitoring and evaluation to address the illiteracy challenges in the country:

A. Training

a. **Intelligent online training systems:** To train large group of volunteers as being planned under the New India Literacy Programme, an online Artificial Intelligence based training system may be put in place. The online system should monitor emotional engagement level of volunteers with features like tailored feedback, evaluation and certification of the volunteer as an instructor. Such artificial intelligence enabled system will also provide uniformity in training and content in optimized time across India. It shall also help in identification of less effective trainers who can either be put through refresher trainings or may be taken out of the system.

b. **Use Virtual Reality (VR) in teacher training programmes:** The volunteers vary in training capacity, age and experience. For simulated and immersive training of volunteers in imparting situational instruction, blended training and management of adult learning environment, VR courses should be designed as part of training programme, which are downloadable from a cloud based server, training performance are recorded and accessible on the cloud for self-improvement. This shall enable self-paced, active mode of virtual training and benefit the teachers in improving teaching methodology through practice and develop student centred teaching. [62]

c. **Mobile App for Adult Literacy Training:** Adult literacy training modules can be developed and provided to volunteers through a mobile app to ensure accessibility and awareness of literacy campaign with ease of participation among volunteers.

B. Teaching

a. **AI based Customised Content:** Leverage technology to customise adult learning content to the specific needs, interests and learning levels of the adult literacy participants.

b. **Mobile App for Learning:** Delivering lessons through mobile phones, will ensure wide reach of the content, reduce the intensity of the engagement of trainers with the adult learners and shall also help in continued engagement. The availability of the content through this mode will also provide flexibility to the learners to learn at the time that is best suited for them.

c. **Enabling multi-channel learning with Same Language Subtitling (SLS):** Fast tracked SLS technology integration in Television and OTT will allow self-paced learning for adults. SLS should be made mandatory for all entertainment contents on TV and OTT.

d. **Introduce Text-to-speech modules for SMS in feature phones** [63] -To use mobile based literacy initiative and bring cognitive learning, develop long term reading and orthography, even basic/feature phones have integrated text to voice features which could be leveraged to develop text reading capability. For developing this capability in multiple languages, the mobile phone firms can develop local language based applications. [64]

[62]https://www.ericsson.com/en/blog/2019/2/connect-to-learn-vr-in-the-classroom
[63]https://www.nokia.com/phones/en_in/support/nokia-110-4g-user-guide/accessibility
[64]https://www.business-standard.com/article/companies/karbonn-mobiles-to-launch-apps-in-local-languages-115071501096_1.html

Non-Government Literacy Initiatives

I. Same Language Subtitling[68] - IIM-Ahmedabad+ PlanetRead

Same Language Subtitling (SLS) leverages existing mass media platform and subtitling the audio-visual content in the language of audio track in sync. Since 1999 weekly telecast of Chitrageet- a Gujarati film song –is being subtitled in Gujarati. In 2010, Chitrahaar, a DD National film song program started using same language subtitling where Hindi subtitles of the song's lyrics scrolled across the screen.

SLS of audio-visual content creates a steady stream of consistent grapheme-phoneme associations in the brain that already knows the language and letter-sound correspondence. Exposure to SLS on TV, only for 30 min per week over a six-month period, led to measurable improvement in reading skills among adults in India (Kothari et al. 2004).

SLS programme benefits women in particular, which formed large segment of early literates. SLS offered people the option to use reading skills on a daily basis. Regular SLS exposure achieves three things at scale: 1) assured reading skill practice and improvement, 2) language learning, and 3) media access among the Deaf and Hard of Hearing (DHH).

In a research article to access the effects of SLS on literacy, and it was found over nearly 5 years, with no exposure to SLS, i.e., in the Low-SLS group, 6.1% of adults (15+) transitioned from unable to read a newspaper to reading one at least once a week. SLS exposure transitioned 11.2% more adults (15+) to reading a newspaper at least once a week. Daily newspaper reading went up by 2.1% in the Low-SLS group and by 15.6% in the High-SLS group.

In 2019, Ministry of Information and Broadcasting announced a set of Accessibility Standards that require all major TV channels (around 900) to provide same language subtitling in at least one program per week in 2019 and to ramp up captioning to 50 percent of all TV programming by 2025.

II. Adult Literacy Program (ALP) - Tata Consultancy Services

The Computer Based Functional Literacy (CBFL) Programme was initiated in 2000 by Tata Consultancy Services (TCS) with the objective of using multimedia to strengthen adult literacy. It comprises of a multimedia software package and e-Learning system that helps to learn basic reading, writing and arithmetic. The technological mode was opted to eliminate challenges in traditional teaching methodology. It benefitted 15 states in India and Burkina Faso in Africa. In 2000-2009, the CBFL-based ALP programme reached more than 1,20,000 people.[69]

In CBFL, graphics patterns for visualization and audio appreciation is used to help in recognition, retention & recollection of information. The content is presented via a multimedia puppet show and focuses on individual words rather than the alphabet, with the aim of teaching learners to read and write 700 commonly used words in their native language. The content is provided in nine Indian languages (Bengali, Gujarati, Hindi, Kannada, Marathi, Odia, Tamil, Telugu and Urdu) and three foreign languages [Arabic, Northern Sotho (South Africa) and Moore (Burkina Faso)].

TCS worked with partnering organizations/non-governmental organization to carry out the program, connect to cite of intervention, and perform baseline surveys to identify people in need of literacy education. Before the Covid-19 pandemic, laptops and the designed application/software were provided to volunteers from

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[68]https://uil.unesco.org/case-study/effective-practices-database-litbase-0/reading-billion-same-language-subtitling-india
[69]https://www.researchgate.net/publication/258052421_Transforming_Literacy_through_ICTs

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