Landscape Mapping of the Visual Disability Sector in India

Stakeholder Perspectives & Recommendations for Action

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BOSCH

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vision empower

Published by: Vision Empower, W103 Innovation Center, IIIT Bangalore, 26/C Electronics City, Hosur Road, Bangalore – 560100, this report seeks to summarise the landscape of unmet needs and challenges and present recommendations for way forward for the sector of visual disability in India

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Glossary of Acronyms:

ADIP - Assistance to Disabled Persons for Purchase/Fitting of Aids and Appliances

AT - Assistive Technology

ATM - Automated Teller Machine

B.Ed - Bachelor of Education

CABI - Cricket Association for the Blind in India

CBM - Christian Blind Mission

CBR - Community-Based Rehabilitation

CCPD - Chief Commissioner for Persons with Disabilities

CSR - Corporate Social Responsibility

D.Ed - Diploma in Education

DDA - Department of Disability Affairs

DFI - DAISY Forum of India

HTML - HyperText Markup Language

IBA - Indian Banks' Association

IIT - Indian Institute of Technology

INR - Indian Rupee

IoT - Internet of Things

IRDAI - Insurance Regulatory and Development Authority of India

KRA - Key Result Area

MGNREGA - Mahatma Gandhi National Rural Employment Guarantee Act

MSJE - Ministry of Social Justice and Empowerment

MSVI - Moderate and Severe Visual Impairment

NAB - National Association for the Blind

NCERT - National Council of Educational Research and Training

NEP - National Education Policy

NHFDC - National Handicapped Finance and Development Corporation

NIEPMD - National Institute for Empowerment of Persons with Multiple Disabilities

NIEPVD - National Institute for Empowerment of Persons with Visual Disabilities

NGO - Non-Governmental Organization

NMC - National Medical Council

NPCB&VI - National Program for Control of Blindness and Visual Impairment

NPCI - National Payments Corporation of India

NSS - National Sample Survey

O&M - Orientation & Mobility

PR - Public Relations

PwD - Persons with Disabilities

R&D - Research and Development

RBI - Reserve Bank of India

RCI - Rehabilitation Council of India

RPDA/RPWD - Rights of Persons with Disabilities Act

RTI - Right to Information

SCERT - State Council of Educational Research and Training

SHG - Self Help Group

STEM - Science, Technology, Engineering, and Mathematics

TLA - Teaching Learning Aid

UDL - Universal Design of Learning

UPI - Unified Payments Interface

VI - Visual Impairment/Visually Impaired

WCAG - Web Content Accessibility Guidelines

XRCVC - Xavier's Resource Centre for the Visually Challenged

Table of Contents

Executive Summary

The report presents the results from a comprehensive landscape mapping research that examined stakeholder perceptions regarding the current state of programs and inclusion for persons with visual impairments in India, identifying critical unmet needs, systemic challenges, and opportunities for meaningful intervention. Through in-depth qualitative research involving 35 expert stakeholders and a narrative synthesis of available literature, the study identified persistent gaps and future prospects across education, financial access, healthcare, and community participation, while highlighting structural barriers that have limited the scaling of successful initiatives.

Key Findings

Education

Stakeholders perceived significant deficits in educational access and quality, characterised by:

- Early intervention gaps where children often begin formal education several years after optimal learning periods, primarily due to family reluctance to utilise residential facilities. This delayed entry creates compound disadvantages in both academic and developmental domains, particularly affecting students from rural and economically disadvantaged backgrounds.
- Compromised quality of education where students advance through grade levels without mastering fundamental concepts or acquiring critical life skills. This was perceived to stem from an overemphasis on examination clearing rather than conceptual understanding and skill development.
- Systematic suppression of aspirations through pervasive low expectations from educators and community members. Stakeholders consistently reported students being actively discouraged from pursuing challenging subjects or ambitious career paths, with the default guidance directing them toward government positions where "work will not be expected."
- Near complete exclusion from STEM education by grade 8 for most students, stemming from both attitudinal barriers and resource constraints. Interviews pointed out to the persistent disadvantages that this gap creates in higher education and career opportunities in an increasingly technology-driven economy.

- Critical shortage of qualified special educators, with states requiring 4000-5000 trainers each to meet basic needs. This shortage is exacerbated by what was seen by many respondents as an outdated training curricula that does not include exposure to modern assistive technologies and pedagogical approaches.
- Poor integration between special and inclusive education models, creating a fragmented educational landscape where neither approach fully serves student needs. Special schools, while providing safe spaces, were also seen as entities that often isolate students from mainstream social integration.
- Extremely low progression rates to higher education, with only 23.1% of special school students advancing to tertiary education.
- Limited braille literacy combined with inconsistent approaches to digital literacy adoption, creating fundamental gaps in communication and learning capabilities.

Financial Access

Persistent exclusion from financial services was experienced despite policy evolution:

- Inconsistent implementation of Reserve Bank of India accessibility guidelines, with analysis of 48 Indian banking websites revealing widespread non-compliance with accessibility standards. The study documented 8,592 WCAG 1.0 violations and 5,024 WCAG 2.0 violations across these platforms.
- Widespread inaccessibility of digital banking platforms and ATMs, despite clear regulatory mandates. Even when accessibility features exist, they often fail to provide meaningful access due to poor implementation or lack of user testing.
- Limited awareness among banking staff about serving visually impaired customers, leading to discriminatory practices and service denials, such as an instance of loan rejection for car based solely on visual impairment status.
- Restricted access to insurance coverage due to perception of disability as an automatic risk factor.
- Employment barriers stemming from misconceptions about independence and safety, particularly affecting higher-skill positions and career advancement opportunities. Employers were consistently seen to prefer candidates with low vision over those with complete blindness.

Healthcare

Stakeholders emphasised several critical gaps in healthcare access beyond eye health:

- Excessive focus on eye health to the neglect of general healthcare needs, creating significant gaps in preventive care and chronic disease management. This narrow focus

was seen to stem from historical approaches to visual impairment as primarily a medical issue.

- Significant infrastructure and communication barriers in healthcare settings, from inaccessible signage to complex navigation requirements. Even premier hospitals in metropolitan areas were observed by stakeholders to lack basic accessibility features.
- Limited awareness among healthcare providers about serving visually impaired patients, leading to compromised care quality and dignity violations, such as instances of medical professionals communicating exclusively with accompanying persons rather than patients themselves.
- Complete absence of accessible health information in appropriate formats, creating barriers to informed decision-making and self-management of health conditions.
- Severely neglected mental health needs arising from daily experiences of discrimination, childhood trauma, and what participants termed "disability fatigue" - the exhaustion from constant self-advocacy.

Community Participation

The findings from interviews highlight pervasive social exclusion:

- Limited participation in public spaces and community activities, reflecting both physical barriers and social stigma. The synthesis of qualitative interviews indicates this exclusion creates a self-reinforcing cycle where reduced visibility of persons with visual impairments perpetuates their marginalisation from community life.
- Restricted access to cultural and recreational opportunities, particularly affecting development of social connections and personal interests. While some initiatives provide audio description for cultural events or adaptive sports programs, these remain isolated rather than systematic interventions.
- Inadequate support for independent mobility and navigation, with participants reporting persistent challenges with street infrastructure, public transportation, and wayfinding systems. The research documented particular concerns around safety hazards from poorly maintained pedestrian infrastructure and street animals.
- Limited platforms for leadership development and decision-making, creating a significant gap in representation at community and institutional levels. The study found this particularly impacts policy advocacy and program design.

Assistive Technology Landscape

The study reveals complex challenges experienced by stakeholders in assistive technology development and adoption

- Fundamental disconnect between technology availability and effective implementation, where existing solutions fail to translate into meaningful impact due to inadequate training, support systems, and implementation frameworks.
- Limited user voice in technology development, resulting in solutions that sometimes miss critical contextual needs or create unintended barriers. Stakeholders reported challenges in sustaining meaningful user engagement throughout product development cycles.
- Significant mismatch between project timelines and implementation realities, where funding cycles often fail to account for the extended periods required for effective technology adoption and integration
- Fragmented ecosystem for procurement and support, creating barriers in maintenance, upgrades, and long-term viability of assistive technology solutions. The study found this particularly impacts institutional adoption of technologies.

Unique Sector Challenges

The research identifies several structural issues limiting scale and impact as reported by stakeholders:

Organisational Structure:

- Predominantly founder-driven organisations lacking systematic processes and succession planning, creating vulnerabilities in long-term sustainability. This was perceived to affect knowledge retention and program continuity.
- Limited multidisciplinary expertise within organisations, with teams often lacking critical skills in areas like management, marketing, and technology
- Persistent challenges in attracting and retaining qualified talent, stemming from limited career progression opportunities and financial constraints.

Collaboration Barriers:

- Competition over limited resources hampering partnership potential, with organisations often viewing similar initiatives as threats rather than opportunities for collaboration.
- Limited cross-pollination between disability and mainstream organisations, creating silos that prevent integration of successful approaches.
- Structural challenges in government collaboration, where fragmented administrative responsibilities and limited political will create barriers to systematic change.

Stakeholders reported particular challenges in sustaining government engagement beyond initial commitments.

Community Diversity:

- Varied needs based on multiple intersecting factors including impairment type, onset timing, geographic location, gender, socioeconomic background, and support systems. This diversity makes standardised interventions nearly impossible while creating resource challenges for individualised approaches.
- Complex relationship between lived experience and program design, where individual experiences can sometimes create biases that limit broader applicability of interventions.
- Significant regional variations in resources and implementation capacity, creating inequitable access to services and support systems. The study found this particularly affects rural and economically disadvantaged communities.

Resource Distribution and Geographic Disparities:

- Significant urban-rural divide in service availability, compounding existing socioeconomic barriers, particularly affecting early intervention and educational outcomes.
- Last-mile connectivity challenges affecting program reach and effectiveness, where successful urban models fail to translate to rural contexts.
- Resource concentration in select urban centers, creating what participants termed "islands of excellence" that serve limited populations while leaving broader needs unaddressed.
- Limited penetration of successful models to remote areas, stemming from both logistical challenges and resource constraints wherein even well-designed programs were perceived to struggle to maintain quality while expanding geographic reach.

Mental Models and Systemic Barriers:

- Prevalence of charity-based approaches over rights-based frameworks, limiting the development of sustainable, dignity-centered interventions.
- Complex interplay between lived experience and program implementation, where individual narratives both inform and potentially constrain intervention design. Interviews indicated particular tensions in balancing individual perspectives with broader community needs.
- Persistent stigma and discriminatory attitudes creating barriers to inclusion across domains. Participants consistently reported experiencing what they termed "daily micro-exclusions" that compound over time to create significant psychological and practical barriers.

Recommendations for Systematic Change

Based on these findings, the study proposes several interconnected strategic interventions:

Mass-Scale Awareness and Cultural Change:

- Develop sophisticated, professionally-created awareness campaigns using mainstream media channels and social platforms to shift sedimented social imagination of those with vision impairments
- Move beyond occasional sensitisation to institute systematic cultural work that challenges ableist assumptions and celebrates diversity through regular visibility in public discourse
- Engage people with vision impairments in telling their own stories, showcasing everyday situations - at work, in social settings, participating in community life - to regularize their presence and capabilities rather than inspirational or tragic narratives

Cross-Sector Universal Program Integration:

- Transform the current disability-specific approach to embed inclusion as a core design principle across mainstream programs in education, employment, healthcare and community development
- Create incentive structures for organisations across sectors to proactively integrate accessibility rather than viewing it as additional compliance
- Foster partnerships between disability organisations and mainstream institutions to enable knowledge transfer and capacity building for universal inclusion
- Institute formal monitoring mechanisms for accessibility compliance that move beyond voluntary guidelines to enforceable standards with clear accountability measures

Institutional Framework Development:

- Establish a national-level consortium of stakeholders to develop coordinated sector strategy
- Create standardised assessment frameworks measuring both quantitative and qualitative outcomes
- Develop comprehensive monitoring mechanisms for accessibility compliance
- Institute formal channels for sustained user engagement in program design and evaluation

Educational Transformation:

- Develop model "schools of excellence" demonstrating high-quality aspirational and inclusive education
- Create cross-stakeholder training programs addressing human resource quantity and quality gaps
- Implement standardised assessment frameworks measuring both academic and life skills outcomes
- Build integrated pathways between special and mainstream education systems

Sustainable Technology Ecosystem:

- Create user-integrated technology incubators emphasizing contextual appropriateness
- Develop comprehensive implementation support systems
- Establish long-term funding mechanisms supporting both development and deployment
- Build local capacity for technology maintenance and adaptation

Community Engagement:

- Create leadership development programs emphasizing diverse representation
- Establish peer support networks with sustainable operational models
- Implement accessibility compliance monitoring systems
- Support development of user-led advocacy initiatives

Funding Reform:

- Extend typical funding cycles to 5-10 years
- Emphasise quality metrics alongside quantitative measures
- Support organisational capacity building
- Integrate accessibility into corporate practices
- Develop innovative funding models supporting systematic change

Progressing towards meaningful inclusion requires moving beyond isolated programmatic interventions to building comprehensive ecosystems supporting sustained change. This demands longer time horizons, more flexible funding approaches, and deeper engagement with the complex realities of disability experience in India. The research particularly emphasises the need for approaches that can simultaneously address immediate service delivery needs while working towards scale and systemic transformation.

Chapter 1: Introduction

Background

The Rights of Persons with Disabilities Act 2016 [1], the United Nations Convention on the Rights of Persons with Disabilities 2006 [2], the New Education Policy 2020, and the Indian Standards on Accessibility for the ICT Products and Services (IS 17802) [3] all uphold the rights of persons with disabilities to equal access and inclusion in all aspects of life. Yet, persons with disabilities remain one of the most marginalised and systematically neglected populations within the country [4].

Persons with blindness and low vision constitute a significant part of the country's population. In recent years, in the absence of government census or National Sample Survey (NSS) data, it has become even more difficult to understand the magnitude of the population and their existing socio-economic, educational, and other challenges. The last estimation of disabilities country-wide was conducted between July-December 2018 as part of the 76th round of the NSS [5].

Scores of governmental and non-governmental interventions in the country have programs that address access and inclusion challenges for persons with blindness and low vision. The active advent of assistive technologies in India since the 1990s has also led to significant changes and transformations in these programs over the last two decades [6].

In the meantime, the evolving Corporate Social Responsibility (CSR) laws and the active interest of corporations in investing in the disability space have led to many CSR initiatives, either investing in existing programs or starting new ones, including internal employment of people with disabilities [7]. The CSR frameworks of ROIs, impact assessment and other metrics have had their unique impact on shaping these ground interventions and, in some cases, making them more impactful but, in some, also creating new challenges.

The current landscape mapping exercise is being undertaken within this complex reality of insufficient data, diversity of interventions, the advent of AT as a powerful influencer and the need for CSR programs to be guided by effective strategy frameworks.

Objectives

- Comprehensively map existing interventions and needs in the space of inclusion and accessibility for persons with blindness and low vision in India.
- Identify the key gap areas within the same and the scope of Assistive Technology interventions to address these gap areas.
- Present macro intervention trends for CSR programs to further build intervention strategies.

Methodology

Design

This qualitative scoping exercise primarily sought insights from select stakeholders in visual disability through semi-structured interviews with experts, stakeholders, and individuals with lived experiences of visual disability and those who have worked in this area. In addition, a narrative synthesis of relevant literature was carried out.

Literature Search and Synthesis

A search was conducted to identify relevant literature (scholarly publications and public reports) on visual disability in India. The search strategy included a combination of key terms related to visual disability and specific areas of interest (education, healthcare, community engagement and financial security) in the Indian context. Additional sources, such as grey literature and hand-searching of reference lists, were selectively utilised to capture a broad range of relevant materials. A narrative synthesis approach was used to analyse and summarise the findings from the included sources, focusing on key trends related to education, community engagement, financial security and healthcare. These four areas were selected for the landscape mapping exercise as they represent the core domains that most significantly impact quality of life and independence for people with visual disabilities, while also being areas where interventions and support systems commonly overlap. They provide a comprehensive yet focused framework that captures both immediate needs (healthcare, education) and longer-term enablers (financial security, community engagement), allowing for systematic analysis of existing services, gaps, and opportunities for improvement.

Participants

A final sample of 35 experts and stakeholders were purposively sampled and participated in semi-structured interviews. The sample included a mix of individuals representing different perspectives and experiences within the field of visual disability: individuals running

organisations that support people with visual disability, teachers and young adults (aged 18-30) with visual disability (see Table 1). Some participants' identities were intersecting as several organisations are run by people with lived experience.

Data Collection

Semi-structured interviews were conducted via video or telephonic call, depending on the participant's preference. The interviews followed a flexible guide that explored key topics related to education, community engagement, financial security, and healthcare of individuals with visual disabilities. The guide was developed based on feedback from select stakeholders and refined through pilot testing. Interviews lasted approximately 45-90 minutes and were audio-recorded with the participant's consent.

Table 1: List of Participants

Participant Code	Designation	Type of Organisation/Affiliation	Lived Experience
R1	Social Sector Leader	Disability NGO	Lived Experience
R2	Social Sector Leader	Disability NGO	Lived Experience
R3	Social Sector Leader	Disability NGO	Lived Experience
R4	Social Sector Leader	Disability NGO	Lived Experience
R5	National Body Senior Management	Disability National Body	
R6	Senior Manager	Leading Manufacturer of Aids and Appliances	
R7	Young Professional	Corporate	Lived Experience
R8	Young Professional	State	Lived Experience
R9	Young Professional	Corporate	Lived Experience
R10	Senior Management Representative	Community Organisation also involved with inclusive education work	
R 11	Principal	School for the blind	
R 12	Social Sector Professional	Disability NGO	
R 13	Social Sector Professional	Disability NGO	

Participant Code	Designation	Type of Organisation/Affiliation	Lived Experience
R 14	Social Sector Professional	Mainstream Education NGO	
R 15	Social Sector Leader	Disability and Education NGO	
R16	Social Sector Leader	International Disability NGO	Lived Experience
R17	Social Sector Leader	New Generation Disability NGO	
R18	Social Sector Leader	New Generation Disability NGO	Lived Experience
R19	Professor and Disability Office incharge	Higher Education University	
R20	Social Sector Professional	Disability Funding Organisation	
R 21	Senior Manager	Eye Health Care Organisation	
R22	Social Sector Leader	Disability NGO	Lived Experience
R23	Founder	Social Entrepreneurship Organisation and School for Blind	Lived Experience
R24	Founder	Social Entrepreneurship Organisation and School for Blind	
R25	Social Sector Leader	Disability NGO	Lived Experience
R26	Banking Professional	National Bank	Lived Experience
R 27	Social Entrepreneur	Employment Organisation	
R 28	Social Entrepreneur	Employment Organisation	
R 29	Lawyer	Legal Advocacy and Accessibility Organisation	
R 30	Senior Professor and Researcher	Assistive Technology Centre at a Higher Education Institution	
R 31	Researcher and Assistive Technology Professional	Assistive Technology Centre at a Higher Education Institution	

Participant Code	Designation	Type of Organisation/Affiliation	Lived Experience
R 32	Senior Technology Professional and Researcher	Leading International Technology Corporation	
R 33	Senior Professor and Researcher	Assistive Technology	
R 34	Senior Assistive Technology Professional	Assistive Technology Incubator	Lived Experience
R 35	Technology Professional and Founder	Assistive Tech Startup	Lived Experience

Data Analysis

Interview data was transcribed via automatic transcription software and analysed using a summary matrix. The analysis followed an inductive approach, with additional matrix elements and themes derived from the data. Two researchers independently examined the transcripts. Differences in interpretation were resolved through discussion until a consensus was reached. Results were identified by examining patterns and connections across data and participants. One of the researchers came with significant experience as a practitioner in the field, having created a portfolio of interventions at a disability inclusion unit at a higher education institute, engaged in advocacy with various state actors and engaged with universities on inclusion interventions. The other researcher came with a background of developing and researching non-health interventions for community integration and quality of gains among those with mental health conditions experiencing homelessness and poverty. Throughout the analysis process, researcher reflexivity was maintained by acknowledging potential biases, documenting analytical decisions, and engaging in regular debriefing to ensure interpretations remained grounded in participants' perspectives.

Ethics

All participants were requested to give informed recorded verbal consent before the interviews. They were assured of confidentiality, and data were anonymised to protect their identity. Participants were also informed of their right to withdraw from the study at any time without consequence.

Credibility and Trustworthiness

Several strategies were employed to ensure the trustworthiness of the findings. Prolonged engagement with the data and peer debriefing were used to enhance credibility. Researchers also engaged in reflexive practice throughout the study, acknowledging their backgrounds and potential biases.

Literature Review

Key Demographic Trends

Demographic trends related to blindness and low vision in India indicate a complex interplay between age, gender, socio-economic status, and regional disparities. The National Blindness and Visual Impairment Survey 2015-2019 estimates that approximately 5.18 million individuals are blind in India, while 36.6 million live with low vision [8]. India accounts for nearly 25% of the global population that lives with vision impairment [9]. The prevalence of vision impairment increases significantly with age, particularly among women. About 33.8% of the population aged 45 and older experience some form of visual impairment or blindness [9]. Gender differences are observed; women are more likely to be visually impaired or blind across all states in India. Women have 35% higher odds of being blind and 69% higher odds of being cataract blind compared to men but have 27% lower odds of getting cataract surgery; about 35% of blindness prevalence and 33% of cataract blindness prevalence in women is attributable to gender [10].

The age-standardised prevalence of blindness among older adults (>=50) varies across states [9]. Further, vision impairment is correlated with lower socio-economic status, with higher rates of blindness and low vision among low-income groups. Some studies show that low educational attainment is associated with being blind [11, 12] particularly among older adults [13]. Regional disparities in socio-economic status and health care access also contribute to variations in blindness rates. Wealthier areas tend to have better neonatal care facilities, which correlate with lower instances of retinopathy of prematurity-related blindness compared to poorer regions. A systematic review found that childhood blindness prevalence reported in the limited

epidemiological studies ranged from 0.6 to 1.06 per thousand children, while visual impairment rates varied more widely from 2.05 to 13.6 per thousand children [14].

There has been a decline in the prevalence of blindness over time, attributed to increased access to cataract surgeries and public health initiatives, such as the National Program for Control of Blindness and Visual Impairment (NPCB&VI), which centers a medicalised approach to reducing preventable blindness. For example, in one meta-analysis, the pooled prevalence estimates for recent definitions of blindness (>=50) showed a decrease from 9.22% to 3.81% [15]. However, this emphasis on preventable blindness and low vision neglects a disability justice perspective that prioritises the removal of systemic barriers that contribute to the exclusion of people with vision impairment.

Economic Impact

Despite a significant reduction in the prevalence of blindness from 1% in 1997-98 to 0.36% in 2020 [15], the economic impact has grown considerably. The economic costs of exclusion of people with moderate and severe visual impairment (MSVI) and blindness in India are substantial. In 2019, these costs were estimated at 1,158 billion Indian rupees (INR) or $54.4 billion USD, representing approximately 0.57% of India's GDP [16]. The largest contributors to this total were loss of employment (409.1 billion INR), caregiver costs (288.8 billion INR), and reduced productivity in employment (189.1 billion INR). MSVI, being six times more prevalent than blindness, accounted for over 80% of the total costs. Even a more conservative estimate focusing only on employment loss and mortality risk yielded a significant cost of 504 billion INR ($23.7 billion USD) or 0.25% of GDP.

Access to Education

While several non-profit initiatives have engaged in establishing quality education models, scholarships and assistive devices, systemic issues still lead to poor educational outcomes or lack of progression among those with vision impairment although these outcomes are not systematically documented. Niche initiatives that are perceived to have achieved results whether in inclusive schools or in special schools again lack published evidence. As an illustration of the systemic issues in education access, a recent study of digital access found that only 31.8% of learning resource links in the DIKSHA platform are independently navigable by screen readers [17]. Among teaching materials, NCERT textbooks show mixed accessibility with 36.4% completely accessible, 54.5% partially inaccessible, and 9.1% completely inaccessible. State-level materials fare worse, with Tamil Nadu SCERT showing 90.5% complete inaccessibility and Telangana SCERT having 95.5% partial inaccessibility [17].

Braille literacy in India faces significant challenges, with low literacy among the visually impaired population indicated. Research in the North American context in the mid-1990s suggests that children who learn braille at an early age demonstrate literacy skills comparable

to their sighted peers [18], Braille literacy enhances understanding of complex language structures, including spelling, grammar, and punctuation. Braille reading is centered on tactile recognition of characters which engages the visual cortex [19], supporting comprehension and retention of information. Beyond mere reading ability, braille usage helps foster emotional well-being and a positive sense of identity within society. However, in India, the rise of technology such as audiobooks and screen readers is perceived to have led to a decline in braille usage, with many students preferring audio formats over traditional braille due to ease of use [20].

The progression rate to higher education among individuals with visual impairments in India is abysmal. About 23.1% of students from special schools across disabilities progress to higher education and only 0.19-0.22% of seats in higher education institutions occupied by candidates with disabilities, despite a 3% reservation policy in public institutions [21]. The same study found that among students with disabilities, 38.2% are visually impaired. Yet the overall participation varies significantly across different educational streams and institutions with negligible STEM education access. The research, based on surveys and interviews with 250 students, identified multiple barriers across disabilities including physical infrastructure inaccessibility, inadequate assistive technologies, limited support services, faculty competencies for inclusive classroom teaching and assessments and financial constraints, with 65% of students coming from families earning less than ₹20,000 monthly. Only 32% of institutions in this survey have functional Equal Opportunity Cells.

Access to Assistive Technology

Access to assistive technology (AT) for people with visual impairment in India faces significant gaps, as highlighted by the 2018 National Sample Survey and other studies. Only 31.5% of those with vision impairment advised AT are able to acquire it [22]. High-powered glasses (80.4%) are the most commonly used AT, followed by contact lenses (5.9%) and white canes (5%). Government initiatives like the ADIP scheme aim to provide financial assistance but are hindered by complex certification processes and budget limitations. The majority (87.4%) of AT users received the devices themselves, with only 8.2% receiving government assistance. Rural areas face greater challenges, with 56% of visually impaired individuals not advised any AT compared to 50.1% in urban areas. Educational settings, particularly blind schools, struggle with AT shortages, especially for advanced technologies.

A systematic review of wearable assistive technology (AT) emphasises the need for more robust evidence supporting the effectiveness and safety of these devices, particularly in low- and middle-income countries like India [23]. Studies utilising ultrasonic sensors, which are common in Indian research, reported benefits such as decreased navigation time and improved detection of complex obstacles like stairs and moving objects. Hybrid feedback systems, combining audio and tactile elements, were frequently employed in Indian studies and generally well-received by users across various research efforts.

Financial Inclusion

The Reserve Bank of India's (RBI) policies on financial inclusion for blind individuals reflect a gradual evolution towards intent to promote accessibility. Prior to 2008, visually impaired people were often treated akin to illiterate persons in banking contexts [24], significantly limiting their access to financial services. This approach perhaps stemmed from a misguided belief that blind customers were more susceptible to deception due to their visual impairment (observations based field experiences of one of the researchers wherein several blind people were denied banking rights)

In June 2008, following advocacy efforts [25,26], the RBI issued a circular that fundamentally changed this policy atleast on paper mandating that blind individuals be treated as equal customers rather than be categorised as those without education, marking a critical step towards recognising the rights of visually impaired people in accessing banking services. Building on this progress, in July 2011 the RBI issued guidelines requiring banks to provide accessible facilities, including ramps and talking ATMs equipped with Braille keypads [27]. In 2015, RBI issued a master circular with various accessibility requirements including the mandate that all new ATMs installed since July 1, 2014, should be talking ATMs with Braille keypads [28]. The Rights of Persons with Disabilities Act (RPDA) of 2016 made it essential for all public services, including banking, to be made accessible. The RBI was tasked with ensuring compliance with these standards across financial institutions.In June 2019, a high-level committee on digital payments highlighted the ongoing need for financial inclusion for persons with disabilities. This report emphasised that all digital payment methods must meet accessibility criteria and recommended improvements for ATMs and physical banking locations [29].

More recently, the RBI is noted to have sent a communication dated February 22, 2024, directing banks to comply with accessibility norms for branches and ATMs and to provide data on accessible ATMs and branches [30]. Additionally, advocacy groups like the Xavier's Resource Centre for the Visually Challenged (XRCVC) continue to push for better implementation of accessibility standards and maintain resources like the Talking ATM India website [31].Despite legal mandates and regulatory directives from the Reserve Bank of India (RBI) and Indian Banks' Association (IBA), significant barriers continue to hinder access to basic banking services for persons with disabilities, particularly those with visual impairments.

Although the RBI has issued guidelines for making banking services accessible, many banks have implemented solutions only in small measures or ultimately failed to adhere to established standards [32].Digital barriers present another significant challenge. Many online banking platforms and mobile apps are not compatible with screen readers or other assistive technologies, often preventing visually impaired users from completing online transactions independently. A study that evaluated 48 Indian banking websites for accessibility using

WCAG 1.0 and 2.0 guidelines found that none of the websites were fully accessible [33]. Only 12 (25%) conformed to minimum WCAG 1.0 Level A, and none conformed to minimum

WCAG 2.0 Level A. There were 8,592 total WCAG 1.0 violations and 5,024 WCAG 2.0 violations across all sites. The second study by Kaur and Dani provided a more comprehensive evaluation of 48 Indian banking websites using both WCAG 1.0 and 2.0 guidelines [34]. Their findings were even more concerning, showing that none of the websites were fully accessible. While 25% of sites conformed to the minimum WCAG 1.0 Level A, none met the WCAG 2.0 Level A requirements. The study identified 8,592 WCAG 1.0 violations and 5,024 WCAG 2.0 violations across all sites. Common accessibility issues included lack of text alternatives for images, improper heading structure, use of absolute sizing, missing table summaries, and language identification problems. Both studies found no significant difference in accessibility between public and private sector bank websites, suggesting that the issue is widespread across the Indian banking sector. This issue extends to newer services like UPI-enabled cash withdrawal, where many of the approved UPI apps lack proper accessibility features. This points to a broader issue of inconsistent application of accessibility standards across the banking sector. However, some positive initiatives have emerged such as the Union Bank's accessible bilingual ATM and has developed an accessible debit card with tactile markings.

Access to Health

Literature on access to health for people with vision impairments is dominated largely by preventive eye care, early intervention and reduction of blindness programs. Early intervention programs in the Indian context are largely dominated by public health players who utilise strategies to for early detection, treatment, and prevention of visual impairments, aiming to reduce the overall burden of vision problems in the country. In addition to the National Prevention of Blindness program of the Government, in the health sector, organisations like Aravind Eye Care System and L V Prasad Eye Institute offer large-scale eye screening camps, reaching out to both urban and rural populations to identify and address visual issues at their earliest stages while leveraging a pyramidal model of escalating from rural vision centers to tertiary care when necessary. Community awareness is an aspect of this strategy. Organisations like Project Eye way, run by the Score Foundation, conduct campaigns to elicit public participation in regular eye check-ups and seeking available treatments.

A small set of studies have examined effectiveness of various visual rehabilitation interventions in India. Christy (2012) conducted a comprehensive four-arm randomised controlled trial (n=436) comparing different service delivery models, finding positive changes across the three remaining intervention groups, with community-based interventions showing particularly promising results [35]. Gothwal et al.'s research through two significant studies - one examining multidisciplinary low vision rehabilitation in 183 children, and another investigating similar services in 255 adults, both showing substantial improvements in visual functioning [35, 36]. Khan et al. (2002) focused specifically on age-related macular degeneration in 100 adults, reporting significant improvements in visual acuity with both standard spectacles and telescopes [38]

Further evidence comes from Do et al. (2014), who demonstrated meaningful improvements in vision-related quality of life through the provision of low vision aids in a 44-participant study [39]. Vijayakumar et al. (2004) examined community-based rehabilitation with economic rehabilitation components, finding overall improvement in 95% of their 159 participants [40].

While Gothwal et al.'s (2018) pilot study on tablet computers showed no significant changes, Ganesh et al.'s evaluation of low vision rehabilitation in children aged 6-16 years demonstrated significant improvements in both distance and near vision acuity, with notable enhancements in academic and daily living activities [41]. These studies collectively provide strong evidence for the positive impact of visual rehabilitation interventions, though some methodological limitations warrant careful interpretation.

Some other positive developments have emerged through community health initiatives, including mobile health camps specifically designed for VI populations and community-based rehabilitation programs. Recently, Star Health and Allied Insurance launched a Braille insurance policy, "Special Care Gold," specifically for people with disabilities to provide essential medical coverage. However, financial barriers continue to significantly impact healthcare access, with high out-of-pocket expenses for care and limited insurance coverage [42].

Community Participation

No systematic literature on the community participation among those with vision impairments in India could be elicited. However, annual reports of various organisations and their websites offer a glimpse into some initiatives to this end. In the sports sector, the Cricket Association for the Blind in India (CABI) organises national and international blind cricket tournaments. Audio description services are provided by some organisations for movies and theater performances. Infrastructure and accessibility improvements in small measures have been undertaken in urban centers, with cities like Delhi, Mumbai, and Bengaluru implementing tactile paving on some sidewalks and in public buildings. The Archaeological Survey of India has introduced audio tours of heritage sites in partnership with other organisations [42, 43], that has the potential to make tourism more accessible, while digital inclusion is promoted through platforms like Sugamya Pustakalaya [45], a digital library offering accessible formats for print-disabled individuals. The Anubhav Gallery at the National Museum in New Delhi features tactile replicas of historical artifacts [46], allowing visually impaired visitors to engage with Indian art through touch and audio guides. Art and creative expression are promoted through programs such as the Tactile Art Workshops by XRCVC. Employment support is provided through organisations like Winwinaya and Enable India, which offer job readiness training and works with employers to create inclusive work environments. The National

Association for the Blind (NAB) operates Community-Based Rehabilitation (CBR) Programs, providing localised rehabilitation services including skills training and social integration activities. Many local chapters organise regular meetings and activities for VI individuals and their families, facilitating peer support and networking opportunities. The Election Commission of India has implemented accessible election measures, providing Braille ballot papers and audio instructions at polling booths to enhance political participation [47].

However, these initiatives are small scale, fragmented and often sporadic without substantive impacts on shifting the widespread exclusion of people with vision impairments from community life. To illustrate the extent of exclusion, the statistics on government employment

scheme penetration for instance show that only 927 visually impaired beneficiaries were identified under the National Handicapped Finance and Development Corporation (NHFDC) schemes across 19 states, while the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) reported just 1,824 beneficiaries from 12 states [48]. Similarly, according to the Accessible India Campaign, only 623 out of 1,314 identified and funded buildings have been retrofitted for persons with disabilities as of recent data elicited via RTI [49]. These statistics are a window into the large deficits and barriers to community participation that people with vision impairments, especially those burdened with limited socio-economic resources continue to face in India.

Existing Approaches to Addressing Blindness and Low Vision in India

Category	Interventions
Education	Special schools for the blind, often with residential facilities, Inclusive education programs in mainstream schools, Resource rooms/centers to support students with visual impairments, Early intervention programs (though often limited and delayed), Use of braille and digital learning materials, Some STEM education initiatives, Higher education reservations for students with disabilities (with limited onsite disability support with few onboarding systematic supports)
	Special educator training programs, though often outdated, Some capacity building initiatives for mainstream teachers on inclusive education
Assistive Technology	Introduction of digital devices and assistive technology largely in education. Some efforts to create accessible content and tactile learning aids

Financial Inclusion	Guidelines from the Reserve Bank of India (RBI) on accessibility in banking, Some accessible ATMs and online banking portals, Efforts by individual banks to improve accessibility of services
	Quota systems in government jobs for persons with disabilities, Some initiatives focused on employment, Focused technical training programs by organisations
Health	Eye health camps and screening programs, Integration of disability services with eye health programs, Low vision assessments, Disability certification camps
Community Engagement	Awareness programs, though limited in scope, Some self-advocacy initiatives, though underfunded, Para-sports programs, primarily centered around NGOs and schools, Some services building intentional social connections, Some groups organising small or large gatherings in public spaces, Cultural spaces/art/movies access initiatives such as tactile art and audio descriptions
Accessibility	Legal advocacy through courts and the Chief Commissioner for Persons with Disabilities (CCPD), Some efforts to make public infrastructure accessible, Limited initiatives to make daily living products accessible

Intervention Differentiation – Born vs Late Blind

Domain	Born Blind	Late Blind
Sensory Development	Focus on early tactile and auditory stimulation; Emphasis on developing other senses from infancy	Focus on enhancing remaining vision (if any) and other senses; Training to rely more on hearing and touch
Mobility and Orientation	Early start on pre-cane skills and spatial awareness; Emphasis on building mental maps from childhood	Relearning navigation skills using non-visual cues; Adapting existing mental maps to new perception
Braille Literacy	Introduction to braille as the primary reading method from early age; Stronger emphasis on tactile learning strategies	Transition from print to braille or audio formats; May use a combination of braille, large print, and audio
Social Skills	More intensive early intervention for non-verbal communication skills;	Maintaining existing relationships with adapted communication; Learning n e w ways of social

	Explicit teaching of social cues and body language	interaction and body language interpretation
Education	Curriculum adapted from the start for non-visual learning; Greater reliance on multisensory teaching approaches; Early introduction to concrete objects for concept formation; May require more explicit teaching of visual concepts	Adapting existing knowledge and skills to non-visual methods
Assistive Technology	Early introduction to assistive technologies; Focus on non-visual interfaces from the beginning	Learning to use assistive technologies later in life; May need to adapt to non-visual interfaces
Career Planning	Career exploration based on non-visual abilities from the start; May have different perception of job possibilities	Possible career changes or adaptations
Psychological Support	Developing identity and positive self-image; Coping with transitions	Greater emphasis on coping with vision loss and identity shift; May require more intensive counseling and emotional support
Daily Living Skills	Maximising independence across various activities	Relearning and adapting previously visual tasks; Focus on maintaining independence in familiar activities
Memory and Visualisation	Engaging in activities that develop spatial awareness;	Utilising visual memory for understanding concepts; May use visual memory in problem-solving strategies
Rehabilitation Focus	Continuum of rehabilitation programs focused on maximising independence, especially through transition phases	More intensive, shorter-term rehabilitation programs; Focus on quick adaptation to maintain quality of life

Intervention Differentiation – Blind vs Low Vision

Domain	Blind (visual acuity less than 3/60)	Low Vision (visual acuity between 3/60 and 6/18)
Technology	Focus on non-visual aids: screen readers, Braille displays, and audio description tools. Examples: JAWS screen reader, Braille notetakers. Focus on keyboard skills and non-visual interfaces.	Emphasis on magnification and visual enhancement: Magnifiers, large print materials, CCTVs. Examples: Handheld digital magnifiers, screen magnification software, customising visual displays, and using magnification software.
Education	Primary focus on Braille literacy and auditory learning. Example: Intensive Braille instruction, audiobooks	Combination of print literacy (often with large print) and visual efficiency training. Example: Eccentric viewing techniques, use of typoscopes for reading
	Emphasis on non-visual cues: Long cane techniques, echolocation training.	Utilises remaining vision: Visual scanning techniques, use of optical devices for distance viewing.
	Fully adapted curriculum with emphasis on tactile and auditory learning. Example: 3D models for science education, audio-described educational videos	Modified visual materials and training in using residual vision efficiently. Example: High contrast materials, positioning for optimal use of functional vision
Career Preparation	Focus on non-visual work techniques and fully accessible work environments	Emphasis on workplace accommodations and visual efficiency in job tasks
Daily Living Skills	Non-visual techniques for tasks like cooking, cleaning, and personal care. Example: Tactile markings on appliances, organisation systems based on touch and memory	Strategies to maximise the use of residual vision in daily tasks. Example: High contrast cookware, enhanced lighting in living spaces
Sports and Recreation	Adapted sports that rely on sound and touch. Example: Blind cricket	Modified versions of traditional sports with visual adaptations. Example: use of larger or brighter balls in various sports

Rehabilitation n Focus	Focus on developing compensatory skills and alternative techniques. Example: Intensive training in non-visual senses like touch and hearing	Emphasis on visual rehabilitation and maximising functional vision. Example: Vision therapy exercises, training in the use of residual vision
Psychological l Support	Coping strategies for complete vision loss, identity as a blind person	Dealing with fluctuating vision and uncertainty about vision loss progression.
Accessibility	Focus on tactile and auditory cues in the environment	Emphasis on enhancing visual cues and reducing visual clutter
Health	Non-visual techniques for medication management and health monitoring. Example: Talking blood pressure monitors, tactile medication labels	Tools and techniques that leverage residual vision for health management. Examples: Large print prescription labels, magnified health monitoring devices

The distinction between blindness and low vision exists on a spectrum rather than as a binary divide, with many individuals potentially benefiting from interventions across both categories. The selection of appropriate interventions is highly individualised, considering multiple factors, including the severity and nature of vision loss, when the visual impairment began, personal preferences in learning approaches, and the individual's specific functional objectives. Furthermore, technological advancements are increasingly creating more versatile solutions with customisable features that can effectively serve both blind and low-vision individuals. Irrespective of where someone may fall on the spectrum of vision impairment, bespoke interventions to optimise each person's independence and quality of life can be designed.

Chapter 2: Unmet Needs and Challenges of the Sector of Visual Disability in India

Despite decades of intervention in the space of blindness and low vision in India through NGOs, Government, corporate social responsibility programs and entrepreneurs, several unmet needs are perceived to persist. This chapter summarises the perceptions of variegated stakeholders in the Indian context on the unmet needs and challenges in the areas of education, financial access, health and community engagement.

Education

Education for persons with blindness and low vision, from early education to higher education and eventually employability, leaves much to be desired in India. Thematically, based on data gathered across respondents, these may be clustered as follows:

Intervention Gaps	Pedagogical Challenges	Ecosystem Challenges	Resource Availability
1. Early Intervention gaps 2. Quality of education, exposure and aspiration 3. Literacy gaps and associated learning gaps 3. STEM education gaps 4. Higher education challenges	1. Lack of standardised teaching approaches 2. Special and inclusive education models. 3. Multi-Disability Approach and Universal Design of Learning	1. Teacher quality, capacity and availability 2. Last-mile connectivity and regional variations 3. Parent and family role	1. Accessible content and Teaching Learning Aids (TLAs) 2. Access to Devices 3. Resource centre model challenges

Intervention Gaps

Early Intervention is where the challenges to education begin. Often, children start schooling after many years are lost due to parental or grandparental reluctance to send students to school away from home. Schools for the blind tend to be residential facilities away from home, leading to delays in enrollment. There is a need to fix early and middle school intervention first, as the quality of education at this level has been reported as the key reason for future lack of skills and aspirations. Mainstream education organisations in the sector have also noted that whilst early identification for students with blindness and low vision on the field is easy because of the visible nature of the disability, including them in the education system is difficult.

Quality of education, exposure, and aspiration amongst students with blindness and low vision are the biggest causes of concern.

As one of the research participants highlighted,

> "The blindness sector is doing badly. Visual impairment is one of the earliest areas in which education with special needs started. It was probably the earliest area where consultation efforts towards a systematised form of education were created. And yet, after a century of services, we are still quite bad."

- *R 15, Social Sector Leader, Disability and Education NGO*

There is no updated material and pedagogy in India within the field of education in this space. This creates a humongous gap in the quality of education in schools for the blind as compared to mainstream schools. More efforts are made to make materials in these schools rather than teaching. There is a failure to impart even basic disability-linked skills of Orientation & Mobility or independent living and problem-solving. With the focus on oral learning and clearing examinations, comprehension and concept learning take a backseat. This is further accentuated by gaps in access to information during their early school years.

This is coupled with a complete stunting of aspiration and exposure given to the student through the entire ecosystem of schools, teachers, parents and community. The common experience shared by most interviewees was of students being told 'what can't be done'. Expectations from the education system for VI are marred with skepticism, "What will they do this with education?". The underlying assumption is they do not need to learn. The best-case scenario outlined for the student is to seek a government job where work will not be expected. The focus of the educator on defining success is restricted to the student passing exams and getting a job, not learning and education. Students graduate to higher classes without learning concepts, especially in rural India.

Regional factors also impact the quality of education for students. E.g. in tribal areas, where community aspirations are to be in agriculture, children with blindness being part of the same community also have similar aspirations. The quality of school education in places like Delhi or Mumbai is significantly different from those in rural areas. Students migrate to multiple cities and towns through the course of their education having a very different experience in each institution.

There is a systemic flaw within legislation and government structure of special schools that has also been reported to have a direct impact on quality. Special schools have been under the Department of Disability Affairs, Ministry of Social Justice and Empowerment (MSJ&E). This keeps them outside the ecosystem of the Ministry of Education and its related education programs and processes for quality reviews and checks. Only recently has the first special school been transferred to the Ministry of Education while retaining its affiliated hostel facility within MSJ&E. The laws governing education also tend to vary from state to state, further complicating the situation.

Literacy gaps and associated learning gaps are a huge concern. Because of the focus on clearing examinations and oral teaching-learning methods, literacy skills in either braille or digital form are wholly missed in education. Methods to teach braille haven't improved for decades. Access to braille is further reduced as you move away from urban to rural landscapes. Many schools provide braille materials only up to Class 8, and even then, there is often a greater emphasis on audio lessons rather than tactile learning. Additionally, there is a significant shortage of trained educators proficient in teaching braille, which exacerbates the literacy crisis. The lack of adequately trained teachers contributes significantly to poor educational outcomes for visually impaired students. Resource allocation is another critical issue, as the cost of braille books is significantly higher—by about 30-40%—than regular print editions, making them less accessible for many families. The situation is further complicated by the fact that state-run braille printing presses have become defunct, forcing reliance on private publishers.

The shift to digital education during the COVID-19 pandemic exacerbated existing inequalities. Many educational resources remained inaccessible to students with visual impairments due to a lack of adaptation for digital formats, leading to further exclusion from learning opportunities.

The absence of braille literacy is also linked to impacting organisation and analytical skills. When students use only digital mediums, the easily editable capacities of those mediums lead to lesser usage of planning, thinking and organising of thoughts before writing. Further, it also forces the assumption that all students are audio learners. Some students learn better in non-audio format. The absence of such learning options further impacts conceptual learning.

Access to STEM education for visually impaired students in India continues to be low and beset by both attitudinal and resource barriers. Most students have been denied access to mathematics and science education when they reach grade 8, due to persistent misconceptions that those with vision impairment cannot succeed in maths and sciences and the limited efforts to develop and more importantly disseminate adapted teaching methodologies and materials.

Organisations like the Raised Lines Foundation have initiated programs to develop tactile learning kits, including a Tactile STEM Learning Kit that provides resources for mathematics and science, enabling visually impaired students to engage with these subjects effectively. Additionally, Vision Empower has created an accessible learning management platform that promotes experiential learning in STEM subjects, addressing the need for technology and resources tailored for visually impaired learners. Despite these advancements, many visually impaired students still encounter barriers such as insufficient access to technology, lack of trained educators, and misconceptions about their capabilities in STEM fields.

Awareness of Nemeth code – braille code for science and maths expressions is poor, and hence, its usage among teachers and children is almost non-existent. Whilst there has been an increase in the pursuit of STEM subjects amongst students, there is a lack of professionals and teachers who can be available to support them. Building STEM labs in schools currently is a chicken and an egg situation, with no student pipeline available for using the labs and students not being able to study in the absence of labs. There is also a lack of role models, with fewer visually impaired professionals in STEM fields, potentially impacting students' aspirations.

Higher Education challenges subsequently lead to employability challenges. They rarely pursue subjects of interest or those with wider employability potentials. Their choice is limited to what they have done in school and what others have told can be done by them.

The over-cared approach through school and childhood also builds a sense of a spoon-feeding attitude by the time students reach higher education. The transition of self-perception from 'needing to be taken care of' to 'becoming independent' is not something all manage. With limited mobility and self-advocacy skills, they struggle to be part of mainstream higher education, resulting in graduates without life skills.

At the institutional level the readiness of higher education institutions to offer inclusive education, despite some of the best government guidelines, remains a concern. Gaps exist in teacher awareness, accessible content availability and building a holistic inclusive education system for implementation of reasonable accommodation provisions.

Higher education institutes are also plagued with administrative challenges of their own which do not relate to inclusion. Structurally, as systems, they prefer to have standard operating protocols and processes. When a college has students with different disabilities and an organisation approaches them exclusively for students with blindness and low vision, it creates layers of dynamics within the institution, leading to a piecemeal approach to inclusion.

There is a general lack of information gap at the school, student and parental level about career and higher education options. Post-COVID, especially in rural areas, there has been a reluctance to go to cities for higher education.

Reservations in higher education have created a unique ground-level problem. With more colleges mandated to admit students, post-COVID students prefer to stay as close to home as possible. There has been a new trend where the student population is scattered in smaller numbers in a wider set of institutions. Whilst this may be a positive sign, NGOs in the sector who were earlier able to service a group of students in one location are unable to do so now. This has brought the last-mile connectivity challenge to higher education as well.

Pedagogical Challenges

A layer deeper than the actual intervention gaps are those that relate to fundamental pedagogical understanding in the space.

The lack of standardised teaching approaches is a huge factor that builds challenges at multiple levels. Within the sector, due to the diversification of users resulting from multiple intersectionality (like age, degree of vision loss, additional disabilities, socio-economic locations, cultural background, etc.), it is nearly impossible to find agreement on intervention methodologies. E.g. There is a complete lack of agreement on any recommended mode of literacy. A varied set of differences exist in the use of braille and digital forms and the age of introduction of these mediums. As a result, different organisations operate based on their experiences.

Student's baseline is not the same. Large inter-group diversity has been found in students due to the multiple layers of student identity that impact learning. E.g. regional background, exposure to knowledge, socio-economic status, parental support, students' personal aptitude and interest, the age of sight loss etc. This has made it difficult to write standardised curriculums for interventions.

Special and inclusive education models haven't been meaningfully amalgamated in India. There are varying views on the pros and cons of both approaches in the Indian context. Whilst the quality of education in special schools has been a concern, there is also a recognition that they serve a crucial purpose. When parents with children with blindness due to the stigma and prejudice want to disown the children, special schools with their hostel facilities have become the only place where the child is allowed to live and exist.

There is also a ground-level recognition that the implementation of inclusive education has completely broken down, especially in rural areas. Only admissions are given with no school attendance or learning. In some instances, getting access to resource centre/NGO training has been removed as they were considered 'special'. Inclusive is more for enrolment and admission and not for education and empowerment.

There are no sufficient resource allocations for inclusive education to be effective. If one were to set up a special school, one needs to appoint a minimum number of special educators. Similar mandates for inclusive education are completely missing and Rehabilitation Council of India (RCI) is perceived to not engage on this front substantively.

As reported by one of the respondents

> "Within the inclusive education frameworks of state governments, only two or three special educators are appointed for entire blocks. This is not only for students with blindness but also for all students with disabilities in the block. The total salary of the special educator is a measly sum of 16,000, which includes a travel allowance. Because they are required to stay in the block and their families may not be living there, they bear the additional cost of the house. Where is the energy left in this special educator to even introduce braille or any other skill to the children in inclusive schools in these areas?"

- *R3, Social Sector Leader, Disability NGO, Lived Experience*

Special schools seem to do well in one area, which is to enable students to build a secure disability acceptance. As a respondent shared,

> "The overwhelming positive of special school is the innate comfort with self. That they tend to do well."

- *R9, Young Professional, Lived Experience*

The other side of this story is also the difficulty faced by students from special schools in their older years to get included in colleges and employment due to their hesitation and uncertainty about engaging with the sighted community. When structured support is available, and institutes know inclusion, experiences have not been challenging. But in places where this is missing, and inclusion often is for name's sake, students from special schools tend to be more unsure and hesitant about how to proceed.

Whilst students coming from inclusive education schools find higher education transitions easier, they report a strange feeling of being an "insider-outsider" when engaging with the community of persons with disabilities. A feeling of becoming an in-between person creep in,

where one shares some common experiences with the sighted and some with the disability community.

It has not helped that the government itself has been not consistent on its commitment to either of the approaches. Whilst promoting inclusive education in all its education programs it is also simultaneously opening special colleges for students with disabilities. This contrary stand is preventing from the core issue to be addressed.

There is an urgent need to come to a collective understanding of what good education means for all in the 21st century and arrive at what inclusive education means as well. This is completely missing currently.

How do we bridge gaps in the quality of education and a truly inclusive and accepting environment that will enable the child to build comfort and acceptance with self and bring these ideas together in a place with adequate resources and teachers?

As a respondent suggested,

> "A good special school would also only build capacity for inclusion, right?"

- *R23, Founder, Social Entrepreneurship Organisation and School for Blind, Lived Experience*

The Multi-Disability Approach and Universal Design of Learning (UDL) driven pedagogies have also caused some challenges on the ground. Ground experiences of teachers and organisations show that we are far from understanding how a child learns. A lot of research is needed to explore this further. We are using technology and tactile diagrams, but lack insight into how each student experiences them differently. Whilst UDL is a good strategy, accounting for the variability and differentiated learning is a challenge. This is further accentuated when students with multiple disabilities are in a class and a single solution is strived for all disabilities due to a lack of understanding of principles of differentiation within UDL.

Ecosystem Challenges

There are huge gaps within the ecosystem that need to be addressed to make education effective, meaningful, and inclusive for students with blindness and low vision.

Quality, capacity and availability of teachers are the biggest factors impacting education interventions. It begins with a lack of clear understanding of the role of the classroom teacher and special educator in the education of a student with blindness/low vision. This is particularly critical in the formative years.

The next concern is the sheer availability of special educators, the quality of their training, and the non-functionality of the government body mandated to monitor their training – the Rehabilitation Council of India. The training curriculums for special educators are outdated. Assistive Technology and its developments are not adequately represented.

Within government-inclusive education programs, there is a completely unserviceable ratio of special educators to schools and students. Further, many times, the specialisation of the special educator does not align with the disability of the student in class. Sharing of special educator resources between diverse disability sector organisations on the field is not happening.

This glaring gap is reflected in data shared by a respondent,

> "Currently, at least 4000-5000 trainers are needed in Karnataka alone if we have to consider one trainer per gram panchayat. Currently, all NGOs totally can reach a maximum of 2000-3000 students a year when we know that the need is to meet one per cent of Karnataka's population"

- *R5, National Body Senior Management*

As another respondent shared,

> "At the state level, special resource groups set up under the Sarva Shiksha Abhiyan, convergence is happening at the material and resource level sharing between organisations, but at the level of groundwork, manpower sharing is not happening."

- *R20, Social Sector Professional, Disability Funding Organisation*

This means that each organisation faces the challenges of their disability-specific special educator not able to meet the geographical dispersion of students. However, organisations are not able to share their human resources with multi-disability internal referral systems to enable better reach and effectiveness. In regions where NGOs supplement government programs with special educators, the reach is slightly better, but the availability of government special educators is impacted by their other non-teaching duties, such as elections or other administrative workloads.

The irony also is that despite this extreme scarcity of manpower, the legislation in the space prevents non-special educators from operating in the field. General D.Ed. and B.Ed. educators are not officially qualified for disability roles. Especially in areas like orientation and mobility training, even national institutes for the blind can only train educators for their own purposes.

There are also career prospect differences within disability specialisation for special educators. Specific learning disability special educators get better job prospects. There is no career path possible for a special educator of students with blindness. This has always created lack of talent in the space.

The other end of the spectrum in this challenge is the lack of disability awareness and inclusive classroom teaching skills of the inclusive classroom subject teacher. RCI does not have an

inclusive education program. Within the special school set-up, the challenge is in the quality of subject expertise of classroom teachers. The National Teacher Council that prepares the B.Ed. curriculum is not adequately aware of the disability. The bridge courses that they build for general educators are not sufficient.

There has also been a reluctance on part of teachers to accept technology even when students and management may be ready. This is especially true of teachers in special schools who happen to be blind themselves since they are from the pre-AT generation.

Further, for all teacher capacity-building programs, the experience echoed the overburdened role of teachers in schools. They may attend a training program, but to expect self-learning is extremely unreasonable for the kind of workload they have.

Interestingly, whilst there is a general hesitation to try new ideas amongst teachers, there have also been regional variations for the same. E.g. Teachers from Kerela tend to be proactive and forthcoming to learn new things. It is not fully understood what causes these regional variations.

The design of the teacher training programs planned for inclusive classroom teachers within the government machinery has also been found to have some inherent challenges. Most of these programs tend to be multi-disability, with a day dedicated to each type of disability. For the teacher coming in, they may or may not have students with those disabilities in their class that year. The knowledge then does not have a place to practice and leads to loss once the teacher returns back to class.

Last-mile connectivity and regional variations accentuate almost all issues listed above. There is a significant gap between the select few who are able to access services and the vast majority of those who are completely deprived.

Whilst in cities like New Delhi or Mumbai the focus is on digital literacy programs the rural areas have even the basics of braille and education completely missing. These gaps keep multiplying as children grow. The increasing focus of the sector is to enable reach to those in remote areas.

Some of the challenges of accessing remote areas are not disability specific. Lack of internet or infrastructure are common challenge faced with other programs for rural areas as well.

Effective programs especially in education mean a high student-teacher ratio. Recommended ratios are 1:3. This tends to increase the cost of programs which are not workable for scaling up initiatives that impact last-mile connectivity.

Lack of motivation and readiness among teachers and school authorities in some areas and limited engagement between organisations doing ground-level work further add to these challenges

Parental and family roles are significant in the effectiveness of programs. Involvement of parents, especially in rural programs, is missing due to various reasons. Due to economic

compulsions, parents are not able to facilitate their children's travel to the necessary schools/resource centres. There could also be a lack of information and awareness. For students needing to go to hostel-based schooling, as reported by one of the respondents, it is the grandparents who do not wish to send them to hostel-based schooling. There is also a sense of protectiveness within the family that often becomes a roadblock. However, when parents and family are active participants and supportive, they have been found to be the most significant factor in the student's success.

Resource Availability

Various types of resource availability challenges continue to persist in the field. Some of the key ones include the following:

Accessible content and Teaching Learning Aids (TLAs): Very few organisations have standardised guidelines for accessible content production. Even nationalised braille presses do not have a standardised production process. NCERT and SCERT books, despite repeated attempts, remain inaccessible. Revisions to books often render them inaccessible again. TLAs such as tactile diagrams, whilst more readily available today, need training amongst users for their effective use. Young children need facilitation to transition from concrete to abstract concepts in a tactile format. This brings us back to the issue of the lack of adequate manpower to enable this support.

Access to devices remains an issue. Either they are expensive, e.g. video magnifiers or there is a lack of training. Individual-level availability of devices is still a challenge. The distribution through government schemes is shoddy. Follow-up use is an issue. Students end up selling off devices or are unable to use them due to English being the main medium of usage of devices. Sighted teachers in inclusive schools, due to their unfamiliarity with the technology area, are unable to assist students with the use of devices in classrooms. In cases like mainstream products such as smartphones, the family members start using the product rather than the student.

Many education programs in order to address some of these challenges have tried a resource centre model. These have been either district centres or sometimes college or school-based resource centres or independent urban training centres. However, there has been a generalised absence of standardised models of resource centres and training curriculums within them. These centres have worked well within a college or a school where they become the place to provide supplementary training and availability of devices. They have become challenging to operate in rural areas as stand-alone centres.

In rural India, their success then depends on the availability of schools where students can be integrated. These are not always available. Students travelling to the resource centre become the biggest hindrance. Daily wage-earning parents cannot afford to accompany their children.

Once they reach the centre, due to its stand-alone nature there is always a possibility of not being able to receive adequate guidance on reaching.

The centres need to be where the child is. For adults, they can be anywhere. In either case, one needs to be as close to the people as possible. When travel allowances are given to increase reach, the cost of intervention increases. They have only worked where parents are able to come.

Financial Access

Financial access for persons with blindness and low vision has been a neglected area. The focus has primarily been on employment programs and less on access to financial services and financial literacy. The section below outlines the challenges in both.

Financial Services

There is an absence of financial literacy itself with a near systemic exclusion. Despite some legal directives in the matter, there has been a lack of compliance-driven approach on the part of the RBI to ensure access to financial services for persons with disabilities.

Lack of awareness amongst the last mile staff of banking and financial services remains the biggest roadblock. Awareness and regulation training related to financial access has not been integrated into staff training of any major bank to date. Whilst RBI has been found to ask for accessibility services, there is no actual cross-checking of data shared by the banks. This has led to a situation of compliance on paper but not on the ground.

The RBI has been known to hold the necessary regulatory weight within the banking sector to ensure implementation of their guidelines. However, the will to build this for financial access for persons with disabilities has been missing. In many cases, the guidelines themselves have become outdated. Newer financial technologies, e.g. cash depositors and other machines, have been built inaccessible. There has been no attempt at ensuring new fintech is born accessible and building necessary protocols for the same.

There is no system to monitor and test the accessibility of deployed machines. Banks claim everything is accessible, but there is no system to test that claim. Similar is the case for accessibility to websites and apps. The compliance requirement is a simple yes or no. The accessibility intern becomes user dependent. Based on the user's AT skill set, it may be usable but rarely fully accessible. Only when the fundamental backend used, such as the SBI website's HTML structure, is by default an accessible platform it lends for a good user experience.

There are still instances where banks deny ATM cards to visually impaired customers, despite RBI guidelines explicitly stating that persons with visual impairment should have access to all

banking facilities without discrimination. Many ATMs still lack tactile features, making them difficult to use for blind individuals.

Online banking platforms frequently do not support screen readers or other assistive technologies, complicating digital transactions for visually impaired users. Banks are vendor-driven. Rarely do they build their own products. The vendors have the capacity for accessibility when they service international clients and yet they are not able to insist their Indian client products to be easily accessible. When banks approach them for fixing accessibility, they are either asked to defer till next update or asked for a large cost. Vendor sensitisation and building inherently accessible products needs to also be looked at.

For other financial services, such as access to loans and insurance, there is no standardised experience. Even for opening bank accounts, the experience continues to be varied. As shared by a respondent,

> "Recently a person with blindness was denied a car loan on the grounds of why would they drive or need a car!"

- *R26, Banking Professional, Lived Experience*

Lack of awareness remains the biggest issue. Having a higher number of persons with disabilities working in banks has been a major enabler but not sufficient. Also due to human variations, there is a wide range of variety amongst employees with disabilities who are hired. But unlike persons without disabilities, they end up being made examples out of. This general lack of awareness and insufficient training among bank staff regarding the needs of visually impaired customers also leads to inadequate assistance when these individuals seek banking services.

There are also newer challenges of accessibility for new emerging banking technologies. With the increasing use of touch screens in banking machines, and metaverses becoming financial hubs, whether accessibility will be part of these from the design stage itself or not will determine the future hurdles of this space.

Employment

There are many organisations that have been working exclusively in the employment space for persons with disabilities. A cross-cutting experience for all of them has been recruiting persons with blindness has remained a challenge. Organisations continue to prefer low-vision candidates and other candidates with mild disabilities. The single factor identified to be the cause of their apprehension is their mis-founded ideas of lack of independence amongst persons with blindness and an associated myth of needing to be responsible for their safety and security.

The other side of the challenge of skill set amongst persons with blindness and low vision also continues to be an issue. Some of the key gap areas remain in skills like Excel and the general lack of quality education due to lack of exposure and education in school and college due to lack of inclusion. Their capacity to crack competitive exams is limited due to a lack of exposure to subjects like mathematics, logic and reasoning in their education. These issues are also accentuated for persons with the intersectionality of poverty.

When candidates are skilled or have had access to quality education and hence are in the driver's seat with their talent, then the conversation does not remain about disability.

In the absence of this, companies tend to hire to fill quotas or targets. Candidates are not expected to perform which perpetuates the challenges and further reduces the worth of the individual.

Due to the lived experience, where many persons with blindness have often been abandoned by their families, there is a strong need to seek financial security. This frequently causes them to chase government-based employment over the uncertainty of the private sector.

Post-employment there have been challenges in making the tech ecosystem accessible for the person to operate. Oftentimes getting the assistive technology made available itself takes very long. There is also a general sense of apprehension in interaction. There is fear of possible accidents and associated responsibility.

The apprehension stems from the following: if I have to handhold, then will the performance of my team decline? This fundamental lack of understanding, knowledge and, therefore, confidence in engaging with people with blindness is the biggest roadblock to employment.

Once they realise independence and performance is not an issue then doors open. There is therefore a huge need for education and sensitisation of the workforce. The push might come from management but for inclusion to succeed at workplace, it has to be the front-line manager that also needs to be onboard.

Health

Locating health needs v/s Eyecare Needs

Healthcare for persons with blindness and low vision has been looked at excessively from the lens of eye health alone. This has led to some glaring gaps in the accessibility and availability of health care in general for persons with blindness and low vision

Even within eye care, the awareness of eye donation itself has become a major hindrance to rehabilitation for people with non-treatable blindness. Most people believe you can become

sighted with an eye donation. It is critical to correct the language of awareness, as claimed by a respondent, by calling it cornea donation and not eye donation. The same respondent also highlighted a unique concern with the impact of statements such as those made by prominent people in the public view, one of which was about envisaging a world after ten years of having no blind persons. When repeated enough, these medical research and awareness-led campaigns often reinforce the medical model of disability, making right-based and rehabilitation work difficult.

Groundwork has also reflected that whilst in rural India, health-seeking itself is low, that linked to eye care is even lower. And it is in these communities that it has also been found that when there are eye health-related concerns there are also other health comorbidities.

Within this spectrum of eye health, there is also a new concern where organisations are reporting that they are seeing younger adults losing eyesight due to an increase in diabetes-linked retinopathy. This can be an alarming trend for the future and when linked to demographic variations for those with late-onset blindness may need directed intervention for the future.

Within eye health, there has also been a greater focus on treating eye conditions rather than preventing eye disease.

Access to Health Care

Healthcare access for needs beyond eye health have often presented significant accessibility barriers, with many lacking basic accommodations. This infrastructure deficit has made independent navigation within healthcare settings particularly challenging, often necessitating dependence on caregivers or family members for even routine medical visits. health services is already limited for the general population. Even in metro cities like Mumbai, respondents have reported that even going to the best hospital without sight assistance turns out to be disastrous. The system has no built-in accessibility features either for locating places, or accessing information or with the inherent bias of disregarding the person with disability as a decision maker in health choices.

Barring a recent attempt by an indoor navigation startup, no one is doing anything to build and improve healthcare access. One of the reasons for the same reported by respondents is that funders do not see this as a visible impact. With CSR mandates perceived to prioritise visible, numerical impacts, it is difficult to build projects that look at system-level changes.

Within health access, one part of the issue is simply linked to mobility, with people with visual disability unable to navigate to health services or within the non-inclusive infrastructure of health facilities. The other glaring gap is with information access, as most medical documentation, prescriptions, and health education materials unavailable in formats accessible to people with VI. The digital transformation of healthcare, while promising, has not adequately

addressed accessibility needs, with many hospital websites, medical apps, and telemedicine platforms failing to comply with accessibility standards. Communication barriers between medical staff and VI patients, inadequate assistance during medical examinations, and difficulties in medication management due to inaccessible packaging and labels have created significant hurdles in healthcare delivery. These challenges are particularly pronounced in rural areas, where access to is lacking even further.

Health Insurance

The other factor that has a glaring gap is access to health insurance. There are no clear guidelines for health insurance for persons with disabilities. They are considered as a group at risk of higher accidents, and there is no central mandate on issuance of health policies for them. To the extent that even government-run Ayushman Bharat schemes have no guidelines on insurance for persons with disabilities

Medical Care and Diagnosis

There is also an associated issue of medical care, assistance and disease identification. A respondent shared a challenge not many of us may think of from the lived experience of a woman with blindness

> "A woman with blindness whose husband was also blind reached the doctor only with advanced stage of jaundice because they were not able to pick up the visual cue of the disease at all"

- *R25, Social Sector Leader, Disability NGO, Lived Experience*

Mental Health

This is a completely neglected area in all intervention programs. The sector, in general, has reported how persons with blindness tend to operate more from the charity mindset or want things free or secure. But rarely, if ever, has there been an attempt to understand what leads this particular population in this framework.

Interestingly, in the research, it is also the younger women respondents who raised the issue of mental health for the first time.

Persons with blindness and low vision go through daily lives and experience a series of hurdles on a daily basis. The most significant of them being repeatedly looked down on by others, disregarded, ignored and repeatedly in a space of explanation of how one leads one's life. This can become very frustrating. This leads to aggravated mental health concerns when actual life opportunities get denied on the grounds of disability, and there is also overt or covert rejection from family due to disability.

As one of the respondents shared:

> "No one is talking about it. Some people don't do anything in their life. Some handle it. When one is not accepted in the family, is not able to live independently, and is not able to do anything about it somewhere, it's just going on. Disability itself is looked at negatively, and then mental health is not seen well either. If you say you are facing this challenge, it becomes a double crisis, so people are not talking about it."

- *R7, Young Professional, Lived Experience*

Respondents also reported that the trauma of childhood that tends to remains and the exhaustion from 'everyday you have to fight the world' and 'just being tired', what we would like to call as disability fatigue. Whilst a lot of work is happening around enabling non-disabled to build disability confidence', it is time we attended to enabling persons with disability to release their 'disability fatigue'.

There is a huge gap in counsellors and therapists with accurate disability awareness as well. This makes it even more difficult for even those who want to and can afford mental health care services to access them. The Department of Clinical Psychology at NIEPVD, Dehradun is among the few initiatives on this front with a focus on comprehensive psychological services for those with visual impairment.

Systemic conflict between Health and Assistive Tech

The juxtaposing of health and eye care has also led to another interesting fallout as far as rehabilitation and intervention work is concerned. In India, we have yet to reach clarity on whether Assistive Technologies needs to be located within health care or elsewhere. The WHO has begun to place AT within broader healthcare programs and internationally. Also, AT has been included in health tech programs and distribution models within health insurance. In India, this clarity is still evolving and can have wider implications for work in the sector. Sometimes, new startups may prefer to be located within health tech rather than assistive tech for a wider appeal.

Community Engagement

Larger societal level and community engagement for persons with blindness and low vision continue to have many hurdles.

Awareness

This remains the single largest hurdle reported across respondents, impacting challenges across all gap areas listed. The perception of the blind has simply not changed. The quality of

education and exposure accessed by persons with blindness and the gaps created thereof impact the quality of interactions, engagement and interaction.

As shared by one of the respondents,

> "Their existence and their citizenship is overlooked by many people. No one is giving this population a thought whilst making anything."

- *R 27, Social Entrepreneur, Employment Organisation*

Even the educated and learned and those now part of this sector recognise that before their first interaction with a person with blindness due to the absence of people in everyday life and neighbourhoods, there is a complete lack of awareness. Opportunities to have one-to-one interactions are entirely missing.

From the perspective of people with disabilities, this results in daily having to engage with situations which, as a respondent shared

> "People don't know how to help you or speak to you. You can teach but then you feel very tired explaining every time. If I am in a meeting, they won't speak to me. Every time, I can't keep asking. So I just do work as much as I can and let it be."

- *R8, Young Professional, Lived Experience*

Daily living access

Accessibility of daily living products and experiences is often overlooked. Most products are not accessible or if made accessible lose their accessibility in revisions and upgrades. With the increasing use of touch screens in daily devices, mechanical button products like ovens, mixers gas stoves which were accessible by design have become inaccessible.

The other gap area identified is in a product and a solution-driven mindset where often the experience of daily life is not looked at for its inaccessibility. A respondent shared how,

> "No one is thinking about blind accessible toilets. Why can't there be an audio alert indicating a urinal to prevent unwanted touch within a bathroom? Would the sighted be comfortable using a pitch-dark bathroom by accessing it through touch?
>
> Why does no one look at using AI to have a mirror for the visually impaired that will enable them to have the confidence to independently be dressed before heading out?"

- R25, Social Sector Leader, Disability NGO, Live Experience

There is a need to look at daily living in a wider framework.

Leadership, Decision Making and Being Counted

Within the discourse of inclusion, what is getting missed out is 'being counted'. As shared by a respondent

> "I may include you. For example, there are ten people sitting. You are the eleventh person at the table. You are included in the discussion, but does your opinion count in making decisions? "

- *R1, Social Sector Leader, Disability NGO, Lived Experience*

To be counted, people with disabilities need to build self-advocacy and leadership skills. There are hardly any programs that promote these. In the experience of stakeholders interviewed, CSR funding also does not support such initiatives sufficiently

The other side of this coin is when you are not counted, persons with blindness end up only focusing on their community interests. If there is no broadening of the base interest, it is difficult to become a leader of a wider inclusive group. Only if one is seen as a participant and contributor, will people support the leadership.

People have been focused on survival. At best, become independent of caregivers. It has been difficult to move beyond that to be confident and skilled to get into the space leadership at a wider political level.

Infrastructural challenges

There are many aspects of infrastructural accessibility which are completely overlooked in the current discourse of accessible universal design and accessibility guidelines. The focus for the blind and low vision tends to be around tactile pathways and braille and high contrast signages.

It is often forgotten that structurally it is nearly impossible to locate braille signages in any wide-open public spaces unless you are specifically guided to them. Further, the issue of cleanliness and hygiene of touching braille signages in public places is often overlooked.

There are other regularly reported hazards of street animals, be it dogs or monkeys, that cause a constant threat to people with blindness, especially in newer and isolated areas, which is rarely discussed.

In certain spaces like the metro, where accessibility services have been taken up a notch, there may be continued constraints on independent use, as a respondent shared:

> "They insist I can't travel without assistance. You don't have access to your own independence."

- *R7, Young Professional, Lived Experience*

There is a need to look at this wider aspect of infrastructural accessibility from the user mobility experience rather than just sighted architectural worldview.

Sports and entertainment

When it comes to sports, recreation and entertainment in general it has been a lower priority given that other basic needs themselves are not met. The demand from the community itself has not been that vocal.

Building accessibility solutions for entertainment through B-to-B applications for movies like Excel Cinema has been more challenging than building end user-based products as the former needs industry buy in which is difficult to come by.

With regards to sports accessibility, it is essential to recognise that by the very nature of accessibility in sports, not all sports can lend themselves to sighted and blind playing together. Para sports have increased in recent times, especially after Olympic successes. Organisations like the Olympic Quest for Gold have also started para-training. The challenge here is in the very nature of this design. For a group of people with blindness to play, train and practice in a para-sport, they need to be in the same geographical area. Traditionally, para-sports were restricted within the special school ecosystem. With the changed landscape, para-training centres are being set up.

There are also associated concerns about the monopolisation of para-sports through federations without clear bylaws and procedures.

But there is also a need to recognise that with most of our lives moving on to technology, which in some ways is truer for digitally literate persons with blindness, there is also a need to find non-digital recreation sources.

As a respondent shared,

> "I would read for pleasure. I was exposed to accessible art for the first time, so I was like, wow, this is also possible. Being on technology all the time is not healthy also. You also get ear pain with continuous use."

- *R8, Young Professional, Lived Experience*

The associated challenges with lack of more everyday sports and outdoor games beyond athletic or Olympic-level training is also the absence of basic mobility skills itself. When mobility itself is missing the focus of sports has been primarily on indoor games.

Accessibility

Accessibility and the need to advocate for it has been a cross-cutting theme. Within this, there are several challenges currently being faced.

There is a lack of active citizenry to bring issues to court in a sustained manner. There is also a need for more aware and receptive judiciary that can push the envelope for compliance. Non- compliance with CCPD [50] and court orders need to be taken up legally and followed up. Engaging in consistent follow up and working with the court system requires resources.

Whilst the overall CCPD approach is positive, and their judgement doesn't just get ignored, they neither get 100% results nor will they get to functional level accessibility. This process itself takes a year or two. People not familiar with the process might feel frustrated, saying lawyers are not efficient.

Related to this is also the lack of CSR funding for this level of legal advocacy in the space to sustain costs over time associated with labour, documentation and court fees. Whilst these are not directly beneficiary-related training, in the absence of persistently working at this, we will never be able to create an inclusive ecosystem.

Within this, there is also another associated gap of access to pro-bono or affordable legal services regarding denial of rights under the RPWD and other legislations. For building an active citizenry, we also need to build a system where they can get the necessary legal aid to take causes to logical conclusions.

Chapter 3: Challenges and Gaps in Assistive Technology for People with Visual Impairments in India

In India, several existing interventions are already in place to support AT development and distribution. Government initiatives like the Assistance to Disabled Persons for Purchase/Fitting of Aids and Appliances (ADIP) scheme aim to support provision of assistive devices to persons with disabilities. The Accessible India Campaign aims to create barrier-free environments, while national institutes such as National Institute for Empowerment of Persons with Multiple Disabilities (NIEPMD) and Artificial Limbs Manufacturing Corporation of India (ALIMCO) are involved in AT research, development, and distribution.

Non-governmental organisations (NGOs) also contribute significantly to the AT landscape. Organisations like Mobility India provide AT devices and services, while CBM India supports AT provision and capacity building. In the academic sphere, institutions like IITs (Bombay, Delhi, Madras, Guwahati) and the National Institute of Design are actively engaged in AT research and development, focusing on universal design concepts. The start-up ecosystem in India is increasingly contributing to AT innovation. Incubation centers like BETiC at IIT Bombay are fostering AT innovation, while start-ups such as Neo Motion and Flexmotiv are developing indigenous AT solutions. These innovations range from text-to-speech software to Braille displays and smart canes, all aimed at enhancing the independence and quality of life for visually impaired individuals. The focus is on creating affordable, India-specific solutions that can be widely adopted.

Several trends are shaping the AT landscape in India. There is an emphasis among players on developing affordable solutions, with efforts to create low-cost versions of devices. Digital technologies are being leveraged extensively in AT development. The increased use of 3D printing for customised prosthetics and orthotics, and the development of smartphone apps for

various disabilities are emerging trends. Localisation of AT is another key focus area, with designs being adapted to suit Indian lifestyles and environments, emphasising durability and ease of maintenance in rural settings. The integration of AI and IoT in AT is gaining momentum, leading to the development of smart assistive devices like AI-powered prosthetic hands and IoT-enabled devices for remote monitoring and support. There's also a growing emphasis on universal design, aiming to create products and environments usable by all people.

Multidisciplinary collaboration is being pursued in pockets, with partnerships forming between medical professionals, engineers, designers, and users. This ties into the trend of user-centered design, which involves greater participation of persons with disabilities in the design and development process. Service delivery innovations are exploring community-based rehabilitation models and the use of telemedicine for remote AT assessments and follow-ups. Policy initiatives, such as the implementation of the Rights of Persons with Disabilities Act 2016, are driving AT demand and emphasising AT in healthcare and education policies. While these trends indicate a growing and dynamic AT ecosystem in India, with a focus on developing contextually appropriate, affordable solutions, significant challenges remain in scaling up these interventions to meet the large unmet need for AT in the country.

Overall though the assistive technology landscape for visually impaired individuals in India presents a mixed picture, with significant disparities in access and adoption across different regions, domains and socioeconomic groups. While technological advances have created unprecedented opportunities for enhancing independence and quality of life, significant gaps remain between the development of these technologies and their practical implementation in the Indian context.

While functional assistive technologies exist, as one respondent pointed out, they represent only about 20% of the solution. The remaining 80% involves critical aspects of training, adoption, and sustained implementation—areas where substantial barriers persist. Challenges span multiple dimensions that require careful consideration and systematic address, from infrastructure constraints and training limitations to market dynamics and policy frameworks. Key challenges and gaps in India's assistive technology landscape may be grouped thematically into:

- The translation of technology development into practical implementation
- The disconnect between embodied user experience and typical sensorial substitution strategies
- Time horizon and project sustainability concerns
- Community and ecosystem challenges
- Market dynamics and business model constraints
- Policy and government support frameworks
- Training infrastructure limitations
- The growing divide between mainstream and specialised assistive technologies

Translating Technology Development into Implementation and Adoption

Respondents cited the most significant challenge in the assistive technology landscape in India as the disconnect between technology's existence and its effective implementation. In many cases, technology is perceived as available and functional but falls short due to deficits in critical aspects of training that hamper implementation and adoption.

Significant gaps persist between available technologies and service users' and professionals' awareness of the scope for implementation. While a plethora of options may be available in assistive technology, very often, frontline professionals working with people with vision impairments and users themselves may not fully perceive the scope of implementation and integration with daily life to enhance independence and quality of life.

For instance, emerging smart home technologies have created new environmental control and independent living possibilities. Voice-activated or app-controlled systems can now manage lighting, temperature, security, and appliances. Yet, many professionals in the sector and users may not realise the full scope of what is possible, focusing instead on traditional physical modifications such as ramps or grab bars, leading to missed opportunities to create more responsive, self-directed living environments.

Similarly, there is often a lack of awareness about the latest assistive software and apps in the educational sphere. For instance, most educators may not have the awareness or skills to leverage advanced text-to-speech programs with natural-sounding voices and customisable reading speeds, which can greatly aid students with visual impairments.

Comprehensive training programs or collaterals to facilitate device usage are often lacking to help users effectively utilise these technologies. Geographical remoteness results in poor penetration and last mile availability. This is further compounded by the high cost of both acquiring and maintaining assistive devices, which can be prohibitive for many potential users, especially those from low-income groups.

Gap between embodied experience and typical sensorial substitution strategies used by Assistive Technologies

A significant gap in assistive technology in India is the limited range of direct consumer voice in technology development. This absence leads to misaligned solutions without adequate user input. Technologies that may be developed risk contextual misunderstandings where a device

may work in theory but fail to consider the practical, everyday contexts of users in India. Lack of iterative mechanisms to incorporate user feedback hinders continuous improvement and relevance of assistive technologies.

Further, the development of assistive technologies for visual impairment often prioritises addressing the immediate sensory deficit, potentially overlooking the broader cognitive, emotional, and social dimensions of the disability. Misalignment of designs with how visually impaired users process information and interact with devices can lead to a significant gap between the technology's intended benefits and its real-world effectiveness. These deficits in considering the entire spectrum of users' embodied experience may result in even well-intentioned innovations falling short of their promise.

For instance, advanced navigation systems designed for the visually impaired may excel at providing turn-by-turn directions, but they fail to account for the cognitive load associated with constantly processing auditory information and lack comprehensive features that gauge intent in context and offer only relevant information. Often those with visual impairment may need to juggle between audio feedback from device and ambient sounds, and traverse through a corpus of information not immediately relevant for their situational awareness needs.

Another instance is the text-to-speech technology's inability to replicate aspects of sustained listening and comprehension, such as natural pacing and intonation or context that a human voice may provide. Similarly, object recognition apps, while seemingly impressive in building awareness of surroundings, entail the act of constantly pointing a smartphone at one's environment, which may be perceived as socially atypical. There are unwarranted cognitive burdens associated with when and what to scan. Some aspects of modern assistive technologies may lead to an overreliance on technology at the expense of developing other sensory compensation skills. Novel assistive technology development may not be sufficiently factoring in how technology integrates into the daily lives of people with vision impairment.

It is pertinent to note here that in the Indian context STEM access for those with visual disabilities is abysmal and their representation in engineering disciplines and among science professionals is low. The barriers are pronounced for those coming from background of added jeopardies such as geographical remoteness, gender or poverty. Further, engineering education in India is predominantly siloes and rarely incorporates social perspectives in approaching technology. Unsurprisingly, while there are small islands of excellence in incorporating the disability perspective, largely the aspect of technology being born accessible is missing.

The implications of this chasm between technology and embodied experience are far-reaching. It may partly explain reduced adoption rates of novel, potentially beneficial technologies, as users find them mentally taxing or socially uncomfortable to use in real-world situations. It results in incomplete solutions that address only part of the user's needs, leaving critical

aspects of the visual impairment experience unaddressed. Perhaps most importantly, it represents missed opportunities for truly transformative assistance that could dramatically improve the quality of life for visually impaired individuals. The general pattern of inclusion of inputs from the user community observed is centered around building accessibility as an afterthought or testing the product. Substantive involvement in conceptualisation, co-design or continual cycles of iterative testing are neglected or limited in scope.

Time Horizons and Project Sustainability

A critical issue that was perceived to stall many assistive technology initiatives in India is the mismatch between project timelines constrained by funding and the realities of implementation. Many efforts fail due to insufficient time horizons for implementation.

Many projects are funded on short-term cycles that do not allow for the extended period required for effective implementation, user adoption, and impact assessment. There is often a disconnect between the expectations of funders or policymakers and the time required for meaningful change in user behaviour and technology adoption. After the initial implementation phase, many projects lack the long-term support necessary for maintenance, upgrades, and ongoing user training. Short project timelines often lead to premature conclusions about the potential benefits or lack thereof.

Community and Ecosystem Challenges

The success of assistive technology was perceived to depend heavily on the existence of a supportive ecosystem. While there is a community around assistive devices in India, there are very limited platforms or events that bring together different stakeholders in the assistive technology field. This absence hampers knowledge sharing, peer support, and collective advocacy. Further, the procurement, support, and maintenance of assistive technologies often operate in a fragmented ecosystem, with continued major reliance on imported devices, lack of last mile penetration, non-standarised training and support resources and inefficient supply chains that sometimes have long waiting periods. Users very often may need to navigate a disjointed ecosystem that includes repair services and upgrade options and cannot access comprehensive, end-to-end solutions.

Market Dynamics and Business Model Challenges

The assistive technology market in India faces unique challenges that affect the development, distribution, and sustainability of solutions. Assistive technology players face significant challenges in scaling their operations while maintaining affordable prices as diverse needs of users means disaggregated markets and limited potential to reach volumes that can assist with fostering economies of scale. For many specialised assistive devices, critical mass cannot be reached within the vision impairment constituency, limiting their ability to become cost-effective. Business models are often overly dependent on outsized estimations of market size. The vast and diverse geography of India, where people with visual impairment are widely distributed, makes it difficult to reach all potential users, especially in remote and rural areas.

Adaptive technologies in automated manufacturing processes to produce assistive devices efficiently and at scale are yet to be leveraged fully. There is insufficient involvement of manufacturers in designing accessible products, leading to a disconnect between design intent and production realities. Large-scale distribution often lacks sufficient customisation options, which are crucial for meeting the diverse needs of visually impaired users. There is potential for developing new low-cost devices based on user feedback from NGOs and schools, but this opportunity remains largely untapped.

Buyer-End user conundrum in the AT Markets

The purchasing dynamic in AT markets where the buyers end users are two different groups significantly impacts product development, pricing, and adoption. Unlike traditional consumer markets where the end-user is typically the primary decision-maker and purchaser, the AT space often involves a multi-stakeholder purchasing model that can create misaligned incentives and barriers to improving technology dynamically. Education institutions, healthcare providers and government agencies as usually the buyers, while people with vision impairment are the actual product users. This separation between purchaser and user can lead to decisions that prioritise cost reduction, standardisation and meeting minimum regulatory requirements rather than maximising user experience or innovation potential. By design therefore products may strive to meet institutional buying criteria rather than end-user needs and preferences.

Policy and Government Support

The role of government and policy in promoting assistive technology for the visually impaired in India is crucial, but several gaps exist. While there are schemes such as the ADIP they are

self-limiting in their remit with little to no supports (such as limited outreach and lack of maintenance and repairs support) for comprehensive adoption. Policies that are relevant are fragmented across different departments and ministries, leading to a lack of coordinated efforts. Policy incentives are further biased towards distribution with limited inputs into scaling private sector involvement in developing and manufacturing assistive technologies.

Training Infrastructure Constraints

The fundamental challenge in assistive technology training stems from severe infrastructure constraints across India's diverse geography. Qualified educators who possess both technical expertise in assistive technology and the pedagogical competencies necessary for effective instruction are often missing. The current trainer pool is largely composed of experienced educators who struggle to keep pace with rapidly evolving technology. These deficits in quality educators become acutely apparent in rural contexts.

Curricula for initiating assistive technology use from early years with incremental progression upto entry into workplace are not standardised. Many training programs often follow ad-hoc approaches, resulting in inconsistent learning outcomes across different initiatives and sometimes variegated delivery is observed even among centres operated by same institution. Without structured progression many users with fragmented knowledge that does not translate effectively to real-world applications. Moreover, existing curricula frequently fail to address the specific needs of different user groups, such as students, professionals, or elderly users, each requiring distinct approaches and focus areas.

Linguistic diversity in India poses a substantial challenge as most assistive technology interfaces and training materials are geared towards English, with insignificant or less than optimal adaptations in regional languages. The shortage of high-quality training resources in local languages limits effective knowledge transfer, especially in rural areas. Regional language support remains inconsistent or entirely absent, for instance in screen readers, making it difficult to provide comprehensive training in users' preferred languages.

There are limited post-training support mechanisms. Absence of ongoing support systems translated into limited application of assistive technologies in real-world situations, after completion of initial training programs. Many users abandon or underutilise assistive technologies when encountering challenges in scenarios that may require ongoing supportive supervision rather than one-time content delivery. This lack of sustained support particularly affects users in remote areas who have limited access to technical assistance when needed.

Many trainees face significant challenges in accessing devices and software for practice outside training sessions. The high cost of assistive technology devices means that resource centres often cannot provide sufficient equipment for adequate hands-on practice. Users from low-

income groups who cannot afford personal devices are left without opportunities to reinforce knowledge and skills through practical application. The lack of practice opportunities leads to reduced confidence in technology usage.

Many training programs fail to adequately prepare users for specific workplace technology requirements, creating challenges in professional integration. The lack of coordination between resource centres and potential employers means that training often does not align with actual job requirements.

Systematic documentation of validated training methodologies, curricula and means of knowledge diffusion is often missing, as most players remain niche and localised in their endeavours without adequate resources being generated to aid replication and scale. The absence of repository of training resources and methodologies leads to duplication of efforts, missed opportunities to incrementally learn from past experiences and build on existing knowledge and experience in the field.

Mainstream vs. Specialised Assistive Tech

Growing disparities between mainstream technology and specialised assistive technology were cited by some interviewees as a challenge. The issue starts with the fact that mainstream technology is rarely born accessible by design. While several technology companies are increasingly focusing on making their mainstream products accessible, this means that the onus of innovation is shifting away from specialised assistive tech developers. Conversely, specialised assistive technology sector is finding it increasingly difficult to keep pace with the rapid advancements in mainstream technology. This lag creates a situation where assistive devices may become outdated or incompatible with newer mainstream technologies. This stagnation can be attributed to various factors, including smaller market size, lower investment, and short cycles of funding with greater demands to become revenue positive. As mainstream technology becomes increasingly visual-centric (e.g., touch screens and graphical user interfaces), it poses new challenges for creating accessible alternatives for the visually impaired. The proliferation of touchscreen interfaces in everyday items like home appliances end up perpetuating new barriers for people with vision impairment.

Misalignment of startup culture with AT Development

The prevailing startup culture of "move fast and break things" and single-product focus clashes with the purpose of assistive technology (AT). While pitch competitions and accelerator programs often celebrate and fund standalone AT solutions, this approach inadvertently sets many AT startups up for failure. Successful AT companies may require a diverse product portfolio, long-term development cycles, and deep integration with education and healthcare

systems to achieve sustainability. In AT development, products may often need years of refinement, user validation, and regulatory approval. Single product focus innovations can lead AT entrepreneurs down a path where they discover too late that the single assistive product is not viable or even if so, cannot generate sufficient revenue to sustain a company. This misalignment has led to a graveyard of promising AT innovations that may have invited accolades initially but could not translate into viable businesses.

Chapter 4: Unique Sector Challenges

During the data collection for landscape mapping, a set of challenges kept repeating across all the key areas the study was trying to explore. This warranted a dedicated chapter to discuss these gaps. They form the crux of not only understanding the area-related challenges but, more importantly, planning future work.

We have categorised these under answering the fundamental question when we look at work across education, health, financial access, community engagement and Assistive Technologies in the sector.

What stops organisations from scaling up their successful work? What has led to work in the sector scattered across the country in small silos with no consolidated sector-level impact?

Organisation Structure and Approach

Most NGOs tend to be organisationally and structurally primarily founder-driven. While this brings in a lot of passion, it often has led to a near absence of organisational structure, human resource policies, and structured strategy. Passion-driven organisations succeed in building effective models and showing results within their area of work but cannot take things to the next level.

Passion-driven founders also tend to have difficulty setting up succession plans or grooming next-generation leaders. While passion and emotion seem to be key factors in getting people started, they often backfire on scaling, sustainability, and collaborations. There is a need to talk about issues and solutions more dispassionately and look beyond personal stances and preferences.

There is an associated concern about the lack of professionalisation within the sector as a whole. Due to the absence of clear, financially rewarding career pathways in the sector, it has always been challenging to attract and sustain the right talent.

Linked to this is also the concern that organisations are not able to build a learning-based culture. Due to overstretched demands and an approach to being reactive and attending to

emergencies, few organisations have the capacity to build team capacities, stay abreast with the latest in the space, or build programs based on long-term strategies.

Most organisations experience a cycle of a core passionate team having high performance. When the team disperses, the organisation's work also gets dismantled, and a rebuild cycle follows with new people joining. This prevents continuity of work and sustaining momentum, both of which are needed for scaling.

The other crucial limitation in the organisational structure is the absence of multidisciplinary teams. Teams in NGOs tend to be skewed on skill sets. The managerial and organisational skills and other specialisation-linked work skills are often missing. E.g. if a corporate had to launch a campaign it would have experts in marketing, PR, products and business. However, if an NGO has to launch a campaign, it often has teams from its direct service programs running campaigns. There is a critical need to make NGO teams more multidisciplinary to ensure improved program quality.

One might wonder that these are challenges NGOs working on other social sector issues also face, yet they can scale. What, then, is the unique challenge of the disability space?

One interesting factor within disability is the discourse, debate and reality of lived experience v/s non-lived experience work. Whilst this holds in other cases as well, due to the fundamental lack of awareness in society and the core experience of fatigue and lived experience of a person with a disability, there is a distinct difference for this space. When a person with a disability starts an organisation to address the challenges experienced by them, along with passion, there is also an overly single-person lived experience-dependent viewpoint that does not lead to sustainable solutions. Whilst the dialogue from people without disabilities has been missing, there is also a lack of space for an open dialogue from founders of persons with disabilities. There is a need to open up more objective, neutral, research and reason-led joint planning and strategy spaces in this sector.

The other non-intuitive but all-pervasive trend within disability sector organisations is they becoming an exclusive system rather than an inclusive one. The very challenge of inclusion that they attempt to solve has pushed them to approach it from an exclusive standpoint. Beyond training services for persons with disabilities, all other areas of work are the same for people without disabilities. Disability organisations, in addressing them as stand-alone issues, are not able to create effective delivery models. As a result of systemic exclusion, it has been exhausting for the mainstream government or NGO programs to incorporate disability-linked services, though organisations have been attempting this through their work. Over time, this leads to unsustainability for scale.

One also needs to look at the historical and the current placing of disability work within the hierarchy of the social sector. The 'charity-driven mindset to work' is still a massive factor within the social sector organisation towards disability organisations and within many

disability organisations themselves. Within the hierarchy of the social sector itself, disability work and disability NGOs are considered most non-attractive. Unlike other sectors where professionals in the space are trained by diverse professional training organisations, within the disability sector, there has been a near absence of this. It then becomes a huge roadblock to the quality of work and the resulting outcomes.

It has been interesting to note that throughout this research exercise, wherever one can see scale-up succeed, those have been organisations that are not traditional disability sector initiatives. The founders are either running them as non-social sector organisations that are also doing disability work or are led by teams that are more diverse in their backgrounds. E.g., Worth Trust, LV Prasad Eye Institute, Vision Empower, and WinWinaya Foundation. It is essential to share some key factors of these organisation programs to enable what can facilitate scale and what needs to be encouraged in the sector.

In programs of LV Prasad Eye Institute that have demonstrated scale, what has worked are the following factors:

- A holistic intervention at the community level where implementing local staff has built trust and belongingness.
- Starting with half the area and then build and modify the program based on experience
- Having a structured curriculum for the community workers.
- Practical training in working with clients both at the main hospital followed by supervised training in the field

With effective supervised training within three months, they have been able to build ground-level human resources for the programs. The training consists of two months at the main hospital and follow-up training on the field.

This approach needs a more structured and organisational approach to work, which is missing in many organisations.

In the case of Vision Empower, the cross-sector team has played a crucial role. The initial hiring of senior leadership was done through referrals. People who were known to each other and had worked with each other. Most of their initial senior leadership came to the organisation after decades of experience in the corporate sector. They currently hire through mainstream portals such as Internshala, LinkedIn or colleges. This is contrary to other NGOs, which primarily hire through social sector hiring portals or disability sector networks. Their hiring is not restricted to disability experience but focuses on the skill set, e.g. knowledge of mathematics.

They have been able to build a multi-layered organisational structure of a core team, regional managers, state coordinators, school coordinators, and resource people at the school. More

importantly, they have also been an extremely learning-driven organisation. Their programs are designed strategically and not built as reactive funder mandates.

When one studies the model at Worth Trust, one can perhaps call it India's first assistive technology company. It has not only managed to sustain itself through decades but also has continuously expanded. They have not looked at themselves as an assistive technology company. They have always positioned themselves as a manufacturing company that does not do R&D themselves but partner with research institutes for the same and only manufacture products that are needed. They have also interestingly combined being an employer for persons with disabilities with their factories fully run by employees with disabilities. They have also always had an international market to cater to. Their manufacturing business is not limited to AT but also expands to automotive manufacturing.

WinWinaya Foundation is one of the few organisations we came across that has consciously built a Centre of excellence within itself whose exclusive focus is to do R&D and stay abreast with the latest technological developments to increase technology discoverability. With a team of over 50% employees with disability, the organisation and team structure are driven by clear KRAs and performance indicators that demand a professional work culture. The ethos of the organisation has been to grow as lifelong learners. As long as we learn, we can make a difference.' Interestingly their founders also come with years of corporate experience and continue to run a for-profit business along with running the foundation.

Challenges with Building Collaborations

Almost all respondents have reported the need for collaborative work but struggle in building collaborative networks.

As reported by most respondents, the sector seems more competitive than collaborative. Because there is an inherent struggle to access the same resources, organisations can often compete for survival.

Whenever attempts have been made to build collaborations, they are sustained only if there is a driving force, such as someone taking the lead or funding for a project for collaboration.

As shared by one of the respondents,

> "The sector is a graveyard of networks."

- *R10, Senior Management Representative, Community Organisation also involved with inclusive education work*

Collaborations tend to fall apart when either the individual driving the network is no longer available or the funding ends.

Another issue is that there is no cross-breeding of ideas between disability organisations, mainstream education, and community organisations. This makes disability projects independent of mainstream education or community work, making them doubly challenging. Within this cross-sharing, preset ideas in mainstream organisations, despite them being social sector organisations, towards disabilities create blocks. There is a need to co-share expertise to build common programs on the ground.

The additional area of challenge in collaborative work is NGO-government collaborations. Due to the nature of government programs and a complete absence of political will towards building inclusion in a sustained manner, most disability NGOs try to do parallel work or avoid the government completely. Getting the government to be an effective collaborator has been extremely challenging. At the same time, in the absence of government backing, the initiatives, for their sheer size and scope, cannot scale beyond a point.

Often, with government collaborations, as a respondent reported,

> "It is about having the right person at the helm, and finding the right person within the wider machinery requires persistent effort and follow-up."

- *R17, Social Sector Leader, New Generation Disability NGO*

Sometimes, simple issues of who gets the credit for the work come into play in the way of building collaboration. At other times, in models where NGOs take programs to schools, the challenge comes in the way of who is the beneficiary in the equation. Schools themselves are knowledge resources and, hence, may not always appreciate being told what to do. It requires time to build trust for collaborative relationships to become sustainable. As a respondent shared,

> "Finally, everybody wants to see what is in it for them. So, how can it be a win-win? How they can see that, whatever they set out to do, we are catalysts to that and not the main ingredients in the equation."

- *R17, Social Sector Leader, New Generation Disability NGO*

One collaborative effort that can be considered is the DAISY Forum of India (DFI) network. DFI enabled organisations from across the country to come together to build uniform standards for content accessibility and an online accessible library platform. This network has primarily been sustained through the efforts of Mr Dipendra Manocha of Saksham Trust.

Another operational network program has been the See a Million Campaign by Enable India. Enable India has created a framework for selecting partners for training, co-created programs with partners, and offered organisational and funding support to partners to sustain the network. Vision Empower has also, through its persistent and patient effort, been able to build

effective government and NGO collaborations.

Sustaining meaningful work within the funding and government ecosystem

Most NGOs sustain through funding. This is a chicken-and-egg situation for program quality. In the absence of a clearly defined long-term vision and strategies and a decision-making framework for selecting funding proposals, most NGOs end up tweaking programs to ensure funder mandates to maintain financial survival. This has a direct impact on both the continuity and quality of programs.

At the same time, organisations with a clear vision and strategy are also able to attract funding that supports their strategy. Therefore, there is a need for organisational capacity building to enable NGOs to build long-term strategies and seek funding based on them. At the same time, funders need to acknowledge the NGO's long-term strategies as the basis for funding and funder-directed programs.

It is also critical to note that funding organisations have their own templates on salary caps for program staff with NGOs and their own per-child cost of education programs they support. This invariably impacts the quality and number of staff recruited and the subsequent impact of program quality.

Scaling is expected at a pace and cost that is often impossible in such a complex setup. Funding is then diverted to government machinery that offers scale at no ground-level impact. It is crucial to relook at the funding structures, program quality, and scaling challenges in the sector.

It is important to recognise that, internationally, inclusive education and accessibility initiatives have had strong government and compliance backing. In India, both of these have been completely missing. The NGO and the funding space have been trying to meet a gap that is fundamentally too complex to be met in the absence of government will.

The government structuring in India to enable effective inclusion work is completely fractured. The government implementation structure has no systemic cohesion to direct inclusion work. Whilst the Department of Disability Affairs (DDA) within the Ministry of Social Justice and Empowerment (MSJE) is the nodal agency to ensure the rights of persons with disabilities, it has no mandate to do direct work in all the areas of a citizen’s life such as education, health etc which are managed by their respective ministries. These ministries, in turn, have little to no political will and systemic programs to lead inclusion work. This has led to a structural cacophony on the ground that is further aggravated by the differences between central and state-run programs and structure variations.

Funding agencies have often been reluctant to support advocacy initiatives with the government. But if we need to examine the scale and sustainability of initiatives, it is critical to recognise both the absolute absence of political will in this space and the need to proactively build on it.

Extreme diversity of the Community

One often overlooked factor of work in this space is the extreme diversity of the community itself. The amount of intersectionality of disability type, onset of disability, geographic location, gender, family background, level of support received, etc, make the end user an extremely diverse group. The experience of vision impairment as a disability varies considerably across different demographic factors. Many respondents pointed to the crucial role of gender wherein girls and women face "double disability" challenges. For instance, while they tend to perform well once in school, many struggle to even reach educational institutions, with only about half perceived to progress. This disparity widens in later education as girls often are not given opportunities to pursue advanced studies, unlike their male counterparts. Timing of vision loss also creates distinct experiences. Those who lose sight later in life tend to adapt more easily to technology due to their previous visual understanding, though they require more psychological support and family assistance to overcome stigma. In contrast, those born blind typically develop stronger tactile and audio capabilities. Similarly, there are differences in the experiences of low vision vs a vs blindness. Those with low vision experience better employment prospects but have to contend with challenges such as being forced to use braille when magnification would be more appropriate. Social and economic status can paradoxically work both ways. Those from low-income backgrounds may sometimes develop better adaptive skills out of necessity whereas the resources and social capital available to those from higher income households predict better prospects and later life success.

This makes it nearly impossible to have standardised interventions across groups or organisations. As a result, the sector has also been dominated by extremely variant viewpoints, even on the most basic things, such as – what is the ideal literacy method for children with blindness? Digital or braille?

The other overarching mindset amongst adults with blindness that various respondents have observed is the need to seek services for free and government-based jobs for security and a sense of charity-based entitlement. As discussed in the section on mental health gaps earlier, when one digs deeper into this facet, one also recognises that the sense of insecurity within the community due to early childhood experiences, dominated by society telling them 'they are good for nothing', the abandonment within families, the socio-economic background rooted in scarcity of resources, often builds a fractured sense of self in individuals. Since they have never been expected to amount to much, they tend to also build a sense of low expectations from themselves.

As a respondent shared,

> "When a person with blindness goes to a wedding, can you imagine how many other people will come and talk to them? So they'll be alone. And we don't know how to speak to them or how to consider them as a person who is as human as all of us. When they go from the office to their home, believe it, quite a few times, at least once a week, some auto driver will stop and give them some change. Our employee would be making more than the auto drivers, but the minute he sees a blind person, he will think of them as beggars."

- *R 28, Social Entrepreneur, Employment Organisation*

It is critical to push this population to expect more of themselves and set the bar high. However, not all NGOs in the sector agree with this approach. Many NGOs operate from the same charity mindset as society. Hence, we continuously give mixed messages.

Another trend that is perceived to have been changing in the sector is that earlier, people with blindness started organisations knowing their problems. In the current generation, some participants felt that one doesn't see many people with blindness starting grassroots-based organisations. This is also likely to create a new kind of gap over time, where programs may not be rooted in lived experiences.

At the same time, there is an associated issue of lived experiences and participatory design. Often, as discussed earlier, individuals with lived experiences might be heavily biased by their own experiences. Designing programs or products based on a single person's experience may not be wise, as it will not account for the community diversity we discussed above. Hence, a balance needs to be struck.

As much as there are challenges with the sighted not fully comprehending the world of the blind, the reverse is also often true. The respondents also spoke about the presence of a demand for perfection in the community. It is impractical for all programs for the blind to be designed by the blind, and that would not be inclusive either. There has to be awareness within the community about what is possible and what is acceptable during the period of change. To have the community engaged in the program and devote their time has also been challenging. As a respondent shared,

> "People want things, but they don't want to invest their time and effort into it. It's sad. I also don't know how to tackle it."

- *R7, Young Professional, Lived Experience*

This challenge is also associated with the financial loss that the community members might face by sacrificing their income for the day they participate in a participative design experience. An economically viable alternative for consistent participation needs to be planned.

Chapter 5: The Way Forward: Recommendations and Program Design Ideas

Having outlined the unmet needs across the key themes in the earlier chapter, we now share key recommended intervention areas for the various themes and program design ideas. The table below attempts to provide a bird's eye view of recommendations and program design ideas. It is strongly recommended that the chapter be read in full to understand the nuances and details of the recommendations.

Table 1: KEY AREAS OF RECOMMENDATIONS

Area of Interventions	Key Recommended Areas of Intervention	Policy and Advocacy Work	Research Areas to Explore	Potential Technology Innovations
Education	* Intervention that begins as early as possible at the school level * Individualised Approach to interventions through innovative resource-efficient methods that cater to diverse learner needs rather than group-based homogenised interventions. * Aspiration building in students and career awareness - Encourage the pursuit of dreams. * Cater to transition points in students' education journey and provide support during those periods. * Build education programs with a broader Social Inclusion component. * Reimagine Teacher capacity-building programs that focus on the quality of teachers and provide them with career paths in the sector. Build teacher communities that see blindness as an advantage rather than only a challenge to be overcome. * Create sustainable standardised teacher curriculum frameworks for diverse stakeholders with government	*Address gaps in teacher training frameworks and curriculum *Address gaps in special educator appointment and program design for intervention in NEP * Address representation and participation of Disability Sector Organisations within the Inclusive Education programs under NEP both at school and higher education.	*Research and document demonstrable standardised holistic interventions at the school level that reflects the development of students in skill building, academic capacities and aspiration and independence - Build actionable replication TOT models of the intervention	* Innovate on technology to make training feasible at scale * Innovate on technology for making individualised support possible resource efficiently *Innovate on technology for curriculum building and updates.

Area of Interventions	Key Recommended Areas of Intervention	Policy and Advocacy Work	Research Areas to Explore	Potential Technology Innovations
	partnerships that enable regular updating.			
	of training programs (teachers, special educators, volunteers etc.) * Bridge Special and Inclusive education models to create a complementary system that promotes student learning. * Build a national consensus on integrating Braille and AT to work towards a common framework in training and program interventions, *Work on addressing the last mile challenge through innovation and collaboration * Start building the higher education pipeline, * Build a holistic intervention at the school level that addresses all aspects of student life and aims to raise the bar of education for students with blindness building future leaders. Not in fractioned program pieces aiming to only deliver the most essential. * Address the last-mile connectivity through collaborative approaches for both student and teacher training interventions * Address building teachers, special educators and associated manpower for inclusive education programs			

Area of Interventions	Key Recommended Areas of Intervention	Policy and Advocacy Work	Research Areas to Explore	Potential Technology Innovations
Health	* Integrate disability perspective in medical, public health and allied disciplines to enhance inclusive healthcare access for persons with blindness beyond eye care and eye health * Enhance the built environment and informational accessibility of healthcare institutions and clinics * Improve personal health management capacities of persons with blindness and low vision by promoting health education, self-management techniques and availability of accessible diagnostic instruments. * Innovate on technology to enable access to visual elements of self-health care support for persons with blindness and low vision * Work on building ageing support for persons with blindness and low vision * Build and deliver bespoke mental health support for persons with vision impairment across the lifespan.	* Address integrating disability training within health care professional courses * Prioritisation and audit of accessibility of health care facilitating under the Accessible India campaign * Inclusion of disability counselling under existing mental health training courses.	Mental health challenges for persons with vision impairment are completely unreported. The challenges reported by many NGOs and others in terms of disability mindset that individuals bring that makes program implementation difficult have many overlapping factors. Research that explores this would be of great value in designing effective interventions for building independence and confidence	* Apply existing AT solutions for health facility access. For now, this area has been ignored. *Innovating for self-management of health to make visual aspects of self-management accessible
	* Start the conversation on making mental health services available to persons with vision impairment			

Area of Interventions	Key Recommended Areas of Intervention	Policy and Advocacy Work	Research Areas to Explore	Potential Technology Innovations
Community Participation	* Building peer-led networks for mutual aid and interdependence * Actively build family engagement and support programs * Facilitate pro bono legal support and community-driven litigation for the actualisation of rights * Work on building disability right litigation education within the legal community * Integrate disability within cross-sector work through collaborations with other social sector organisations to ensure inclusion is built into community-level work of all aspects as against a disability sector lead initiative for accessibility	*Advocate for disability inclusion within all government departments and programs to ensure that all government programs be it - education, poverty alleviation, healthcare etc address accessibility and inclusion within their framework. Make disability inclusion a cross-department function as against being housed only at the Department of Disability Affairs	There is no information or research on disability experiences within the mainstream social sector or government programs on diverse social issues. This area would be worth exploring to highlight the gaps and advocate for a shift and wider ownership of inclusion	* Innovate on technology to make affordable legal aid available * Innovate on technology to make visual aspects of healthcare self-management accessible

Area of Interventions	Key Recommended Areas of Intervention	Policy and Advocacy Work	Research Areas to Explore	Potential Technology Innovations
Financial Inclusion	* Instituting training and awareness as part of in-service programs and refresher training of financial institute employees * Community-based financial education and training programs for persons with blindness and low vision * Reasonable Accommodations at the workplace to support roles * Mentorship and career pathway programs at work. * Reimagining employment training programs for persons with blindness and low vision that incorporate the following: candidate skill and aspiration as the premise of job seeking, creating internship-based door openings in closed environments, promoting cross-disability workforce to leverage complementary skill sets, training employees to become self-advocates and internal advocates for the expansion of inclusion within the company, *Work towards building future-ready skilling programs that also focus on entrepreneurship training.	* Advocate for regulatory standards that have a higher threshold for compliance requirements and clear audit mechanisms and enforcement protocols with clearly defined penalties for non-compliance with accessibility standards in financial products and services *Advocacy for insurance coverage and premium calculations * An all-India level national certification for financial technologies must be established as part of the regulatory frameworks for the launch of any new financial product to ensure products are accessible		* Technology for integrating effective service delivery training for financial institution employees * Tech-enabled audit tools for checking compliance on the accessibility of financial products

Area of Interventions	Key Recommended Areas of Intervention	Policy and Advocacy Work	Research Areas to Explore	Potential Technology Innovations
Assistive Technology & Accessibility-Advocacy	* Focus on building the training, repair and service ecosystem beyond simply building products * Tools and trained professionals to help need identification of customised individual-based AT and distribution of the same * More organisations to manage the go-to-market for AT companies * Incorporate disability and social perspective along with accessibility inputs in engineering education and practice * Ecosystem for long-term funding that accounts for training, support and continuous improvement * A systematic user engagement ecosystem to participate not only in user feedback but also in co-creation * Promoting tech training amongst persons with blindness and low vision to increase the representation of the community as tech creators	* Policies to integrate accessibility into mainstream products - teach, consumer appliances, mechanical etc. * Tax incentives to make AT more affordable		

Area of Interventions	Key Recommended Areas of Intervention	Policy and Advocacy Work	Research Areas to Explore	Potential Technology Innovations
	* Ensure a framework for user feedback throughout the development phase * Innovate on flexible pricing models and diverse markets to build sustainability and affordability of products and profitability of the companies. *Build heightened awareness around compliance amongst various stakeholders to deter litigation-based compliance * Funding to support grassroots-level legal work to build the necessary compliance network in the country to ensure accessibility* Build digital Accessibility indices and frameworks to bring in standardisation in testing and implementation			

Table 2: RECOMMENDED AREAS OF INTERVENTION & PROGRAM DESIGN

TOP 5 PRIORITY AREAS OF INTERVENTIONS (These areas are not linear but envisaged as simultaneous efforts to ensure a sector-level transformation and impact)
a. Transform School Education by building a school of excellence model (Reference in the dream projects section of the chapter. b. Community-based holistic last mile connectivity program that looks at all aspects of inclusion (through adopting a village model in partnership with local community organisations) c. Cross-stakeholder capacity building a university that addresses the training needs of diverse players across education, health, finance etc. (Reference in the dream projects section of the chapter) d. Awareness – Mass scale innovative national level campaign (Reference in the dream projects section of the chapter) e. Advocacy – Across education, health and financial access to encourage compliance-based government frameworks
RECOMMENDED PROGRAM DESIGN APPROACH FOR INTERVENTION * 5-10 year project timelines * Empowerment-based project and not charity-based * Multidisciplinary teams for project implementation and one with a mix of lived experience and otherwise

* Built-in user engagement design in both planning and implementation phases
* Inbuilt organisation capacity-building elements woven into projects * Facilitate networks to build a macro national level strategy approach to work in the sector that has multisectoral participants. * Need to reimagine CSR to be viewed as the highest form of risk capital with a long-term impact * Need to build platforms for diverse CSR networks and implementation partners to be on the same stage to have multiplayer funding still fitting within a broader common direction for the sector at large. *Build consensus and dialogue-based frameworks for measuring impact that go beyond numbers

Education

Nature of Intervention

For education programs to have maximum impact, an individualised and early intervention approach is considered most effective. No single type of intervention works for groups. Intervention must be individualised at the foundational level or at the time the person encounters disability. Early intervention is a must. For better transitions in higher education, working at the school level is crucial. Several examples show that once the foundational work at school has been effective, the transition into college has been easier. The need for individualised intervention is critical. There is practice observed by stakeholders currently in the sector of grouping students for learning without any assessment of their individualised needs. Finding more resource-effective strategies to provide individualised support rather than doing non-individualised mass-scale programs is wiser.

It is also critical to take a holistic approach to education interventions. One needs to transform the entire ecosystem from school to higher education. Some of the key areas that need to be focused include:

- Career awareness amongst students and building aspirations should be a consistent thread throughout the student's life.
- Transition points are critical and need to be supported, e.g., 8th grade STEM, higher education choice, and employment transition.
- Have a broader social inclusion focus throughout the education journey, including attending to blindism [51].

Stakeholder involvement

Parental and family involvement has played a key role for education initiatives to succeed. It is critical to build awareness and participation amongst the parents, family, and community.

It is equally useful to build effective champion networks that are driven by peer-led initiatives. Finding a sustainable way to have effective role models within the community and have them lead awareness-building and education initiatives at the last mile can be very effective.

For student training as well, using local teachers and siblings instead of just special educators is critical for reaching last-mile connectivity.

Teacher Capacity Building Programs

Capacity building is a huge gap that needs urgent, innovative and large-scale intervention. Some of the ideas that can be explored are listed below:

- For in-service training of mainstream teachers or special educators, programs need to keep in mind a few ideas:
    - AT training needs to be followed up by schools/colleges where teachers work purchasing the technologies and making them available for students.
    - In any training program, it is critical to recognise that ground adoption may happen only with early adopters. To expect a hundred per cent transference on the ground as a marker for success is impractical. Typically, twenty to thirty per cent of people will be early adopters.
    - It has been found more effective to combine teams of sighted and visually impaired trainers to train end users. As much as possible, this combination should be encouraged.
    - Important to update teacher training programs to use the advantages of Gen AI
    - It is also critical to engage with teachers when they have students with particular disabilities or studying that particular subject within the training year. This ensures that the teacher can directly apply training inputs. In the absence of a student to work with, the training input tends to be forgotten.
- Teacher training frameworks and government bodies must be engaged to update curriculums appropriately. Some of the key areas of work needed in this space are:
    - Build an Inclusive Education B.Ed program rather than a general B.Ed program with a single course on inclusive education.
    - Ensure that the Special Ed. program also includes components of the general B.Ed program.
    - The National Teacher Training Council, which prepares the B.Ed Curriculum, and the RCI, which specialises in rehabilitation training, need to work closely to build training programs of improved quality. The National Institute for Empowerment of Persons with Visual Disabilities (NIEPVD) needs to be energised to take an active role and use its government machinery to ensure end-use reach of training programs.
    - In NCERT and SCERT training, inclusive education is considered an annexure. The same needs to be brought as part of the main training.
    - Use mass-scale media channels such as YouTube and other social media platforms to make training information readily available to anyone who wants to teach or facilitate learning for the end student. This training content must be created in the simplest, easy-to-understand formats and widely popularised.

- Reimagining teachers' role in inclusive education, teaching pedagogy, and the nature of teacher training is critical. Some creative ideas that are worth considering are listed below:
    - Focusing on teacher excellence in the subject they teach is critical to ensure student learning. Within special education, the expertise of the teachers is rarely focused upon. When teachers excel in their subjects, they are motivated to teach students what they love and enjoy.
    - One needs good teachers, who may not necessarily come with background of disability. If teachers are passionate about their subjects, enjoy teaching and learning, and are therefore excited when they see a challenge, they will likely be the best inclusive teachers. Teacher training for inclusive education does not need to focus on teaching inclusive pedagogy but more on finding and curating inherently good teachers.

As a respondent shared, when they would hire teachers for their school for blind children, all they would look out for is,

"Are there open-mindedness, creativity and critical thinking skills? Does the teacher focus on how to find solutions rather than seeing disability as a limiting situation? Can we find someone who sees blindness as adventure/advantage rather than only a challenge?"

R24, Founder, Social Entrepreneurship Organisation and School for Blind

    - To ensure that teachers in villages and the last mile have access to resources, it is worth considering that block/village-level resource centres are not built only for students but also used for teacher training and learning.
    - In cases where subject experts are not available as teachers, a hybrid online learning mode can connect the best teachers in those subjects across the globe to teach the students in a remote village.
    - Teacher training programs also need to incorporate more action-based and activity-based approaches to learning. Currently, teachers tend to use lecture-based methodologies, and teacher training programs largely provide inclusive education solutions for that method. Instead, there is also a need to shift that approach at the pedagogical level.
- Reimagining ideas for scaling training is required urgently. Some ideas for the same shared include:
    - Work on building a pipeline for teachers with career pathways to make teaching students with blindness an aspirational career opportunity for young adults. To do this, one can borrow ideas from Teach for India and other similar campaigns in the education space.
    - Training of varied stakeholders is urgently needed. The scale at which this is needed is similar to that of mainstream education teacher capacity building. One

needs to look at the macro teacher training centre or university model. Models of the Azim Premji Foundation for government teacher training can be studied to replicate ideas from the same. Building a certified training hub at one of the IITs recognised through the RCI is worth exploring, especially in assistive technology training for teachers.

- One also needs to expand the availability of teachers on the field beyond only government employees or supplement them. Government teachers with multiple other duties can rarely effectively fulfil their teaching responsibilities. Bring in resources that complement existing teachers and not those that threaten them.
- A collaborative program between four to five large NGOs to build capacities and train teachers who are further deputed in schools is also worth considering as a model.
- Looking beyond the traditional delivery channels can be extremely useful. As shared by a respondent, innovative models within the government machinery can also be explored.

> "The Panchayat raj department has a library in each village with librarians in Karnataka. If we train two thousand five hundred librarians through the seventy-five panchayat officials, then we can create two thousand five hundred village-level hubs."

- *R5, National Body Senior Management*

Bridging Special and Inclusion Models

There is a need to begin bridging the special school and inclusive education models to a meaningful ground-level reality. There is a clear recognition that one cannot eradicate special schools. Their value in being a safe space and a place to begin the journey for many students who are abandoned by families cannot be underestimated. At the same time, we cannot ignore the educational challenges that both special and inclusive schools face in India. Some ideas that are recommended include:

- Build special schools as resource centres and lodging boarding facilities for inclusive schools and colleges in the area
- Build and adopt a camp-based approach where students in inclusive schools can come and attend the camps to learn disability-specific skills. These camps can be held on traditional special school premises.
- As a respondent shared, the term inclusion itself has created a slightly challenging perspective, wherein, the word may inadvertently suggest simply placing those with

visual disability within existing structures without truly adapting those structures

> "Why was integration substituted? In mathematics integration, you need an integer to complete a solution. Inclusion is when, in Chemistry, a mineral is added to a substance. For example, a mosquito is added to an amber; it looks pretty but is trapped."

- *R23, Founder, Social Entrepreneurship Organisation and School for Blind, Lived Experience*

Within education, inclusion has become the practice of students with blindness going inside a class but can't learn there, and then the teacher comes and pulls them out to teach them separately.

As the same respondent shared,

> "We need an approach where blind people are empowered. They can be in every situation, not only integrated but part of it and people forget that there's something different.
>
> If you empower, blindness can be a possible advantage. See beyond the obvious. If we don't train blind to become problem solvers there is a big loss for society."

- *R23, Founder, Social Entrepreneurship Organisation and School for Blind, Lived Experience*

Braille and AT integration

Diverse views on braille and digital literacy need to be addressed urgently at the sector level to build some degree of research—and pedagogical-based framework for the sector as opposed to individual lived experience-based viewpoints.

The braille v/s digital literacy approach needs to be replaced with a braille and digital literacy system. There is a relative agreement, especially for persons born with blindness or early onset blindness, to use braille as the literacy method till class five, along with an introduction to digital tools as early as possible. This enables the dual advantage of both systems being available to the student and a student-driven choice for the complete transition to digital when the student needs to. This also empowers the student to have access to braille as an alternative in adult life for accessing signages, leisure, and any other means of non-digital experiences.

As shared by a respondent, it is also important to recognise certain fundamental advantages of

braille.

> "Braille reading and writing is better for thinking. While learning new concepts, some people are audio learners, whilst others are physical learners. They learn better when they physically take notes. In early childhood, your brain learns organisational tasks by organising writing. Organising your thoughts and putting them down. The non-erasability of a physical medium as against the easy erasability of digital medium is meant to enable better organisation and thinking."

- *R 15, Social Sector Leader, Disability and Education NGO*

As another respondent shared,

> "Braille might eventually be replaced. But not now. Currently, we don't even have the best technology solutions available for all Indian languages."

- *R1, Social Sector Leader, Disability NGO, Lived Experience*

Therefore, it is critical that all educational programs incorporate both braille and digital literacy training and not focus on replacing the latter with the former. The two can coexist and, in fact, need to.

Finding Solutions to address the last mile and resource model challenges

Last-mile connectivity seems to be the biggest hurdle being faced currently. Some approaches that can be explored to address as shared by respondents are listed below:

- Save the Children adopted a model that was found effective but was not scaled. This model can be revisited. Key skills were identified for training, e.g., Braille, O&M, and Mathematics. They asked for volunteers from the community—village-level bank employees, bus conductors, and retired school teachers—to come for training. They got materials and activity sets to implement the training with students in their villages.
- Hybrid classrooms have proven to be effective and can be leveraged more.
- Use innovative methods like radio/community radio programs to reach training inputs for local volunteers or direct students
- Every inclusive school must have at least three to four special educators. RCI should

come up with this mandate

- Resource centres especially for younger students need to be located within schools. They can also supplement as therapy centres for students with other severe disabilities.
- Any resource centre set up must also have an outreach-integrated model where the teacher reaches the student needs to be considered.
- For outreach-integrated models, it is also essential to build a student assessment and priority-based intervention system. A framework that can balance the use of volunteers and special educators based on student needs will help address resource constraint issues.

As shared by a respondent whose program attempts this,

> "'When we identify the child, we build a peer– parent/community volunteer. Conduct peer training and have a regular follow-up. This works very well. Parents are keen to support children. For girl child, mothers tend to be close. Wherever the mother is educated and concerned or if they have an elder sibling, this model works very effectively."
>
> - *R20, Social Sector Professional, Disability Funding Organisation*

Higher education

Higher education inclusion is key to effective employability. Some suggested areas of work in this area are shared below:

- Taking a ten-year horizon on what the future will look like and building higher education and skilling programs in line with the same is critical.
- Inclusive higher education needs a professional approach that is based on reasonable accommodation policies [52] that can integrate with the educational institute's systems and processes.
- Building an inclusive student community is an extremely critical aspect of building inclusive higher education.
- For high-support students, it is useful to tap into student resources.
- Whilst management-directed initiatives can create a start, they need collective bottom-up action to ensure inclusion is not an echo chamber or an exclusive set-up within the institution but is owned across the organisation.
- To build effective reasonable accommodation provisions, the team needs both academic subject experts as also disability professionals. A cross-skill team is essential.

Health

Integrate disability perspectives in medical training

Integrating disability perspectives in health education across medicine, public health and allied disciplines can help build capacities of staff to tailor services considering disparities in health that arise due to systemic exclusion of those with vision impairment.

- While eye health initiatives that aim to prevent vision loss are perhaps suited to specific types of vision impairment, the recognition of blindness and low vision as a variation in human diversity and not necessarily as a disease or a deficit will be essential to build competencies that consider enhancing health related quality of life of people with vision impairment. Both module development that can support inculcation of attitudes and skills and advocacy with centralised education bodies such as the National Medical Council (NMC) to integrate these as part of standardised curriculum may be important.

Enhance built environment accessibility across health institutions in public and private domain

To create accessible healthcare settings, built environments across both public and private need substantive enhancements. This involves:

- Developing basic compliance standards for the industry and implementing measures such as unambiguous wayfinding systems with multiple modes of communication such as tactile flooring indicators, high contrast signages and adequate lighting.
- Healthcare experiences need to be designed to promote autonomy, dignity and confidence for those with visual impairments to navigate their patient journeys. Intuitive, multi-sensory engagement across key transaction areas, such as reception counters, waiting areas, and consultation rooms, should be designed to promote familiarity and control over the healthcare environment over a period of time. All allied digital interfaces, such as those to schedule appointments, must similarly be accessible by design.

Develop and disseminate accessible information on health and self-management techniques and strategies for people with vision impairment

For people with vision impairment to take control of their health, a wider range of players in the disability and healthcare sector need to develop and make available widely an accessible suite of resources for foundational healthcare literacy.

- These will include specialised self-management techniques with use of non-visual

sensorial abilities, strategies for medication management, independent health monitoring, informed decision-making, healthcare system navigation and wellness routines that acknowledge specific mental health needs that arise out of stigma and vision loss.

- Modules may require structuring to accommodate progressive learning, from basic self-care principles to health management strategies, while remaining adaptable to varying degrees of visual impairment.

Enhance availability and use of accessible diagnostic support instruments that may be used at home

- Health monitoring devices with non-ocular centric interfaces and feedback mechanisms, such as voice-guided blood pressure monitors, glucose meters, medication organisers with haptic feedback, need wider distribution and adoption among specific user groups appropriate to the health conditions concurrent to their disability.
- User-directed transmission of information to healthcare providers may be useful for supporting remote monitoring and timely intervention.
- These need to be accompanied by training programs that build user confidence in device operation, troubleshooting, and data interpretation alongside accessible instruction materials in multiple formats.

Integrate non-visual cues to support self-reporting health symptoms.

For people with vision impairments to accurately monitor and communicate their health status, both a taxonomy of non-visual symptom indicators and vocabulary of non-visual descriptors of symptoms, that emphasise tactile, auditory, and proprioceptive cues, need to be developed. The framework may incorporate regular calibration checks through healthcare provider feedback, ensuring that interpretations of non-visual cues remain consistent and clinically relevant over time.

Develop supports for ageing in place

Ageing alongside a disability enhances the challenges of maintaining independence, agency and dignity in living arrangements and care. In this context, there is a need to develop a cadre of disability-aware personal assistants who can comprehend age-related needs and deliver tailored supports for elderly with vision impairments to continue to live in the community for as long as possible or in community-like senior living facilities. Senior living and care services, while evolving, are limited in the Indian context and further require better integration of accessibility for those with vision impairments.

Deliver bespoke mental health supports for people with vision impairment across the life course

Mental health supports for people with vision impairment need to be developed and implemented from a life-course perspective congruent and responsive to evolving needs across ongoing life transitions.

- Mental health teams that deliver such supports require a multidisciplinary composition consisting of both core mental health expertise and those with experience in vision impairment.
- Therapeutic encounters need to build critical consciousness, enabling people to resist pervasive stigma and exclusion while developing a stable sense of identity, and personal and collective support resources.
- The role of supportive social networks was emphasised by several interviewees, particularly the cushioning effects of a family and educators who do not place any limits on their aspirations. Therefore, in addition to professionalised typical individual or group-based therapeutic interventions, it is imperative to focus on peer support networks that foster collective agency, family-inclusive interventions, and interventions that address specific mental health issues such as spatial anxiety, social confidence and grief associated with progressive sight loss.
- Access pathways through both healthcare and education need to be established via adequate self-reporting as well provider screening mechanisms leading to referral processes and collaborative care planning between vision specialists, mental health professionals, and disability support services.

Community Participation

Build Active Peer-Led Champion Networks of Mutual Aid and Interdependence

Initiatives that curate and develop networks of successful individuals with visual impairments to serve as mutual aid networks, community leaders, and change agents need to be supported.

- These networks may engage in building peers support groups with emphasis on relationships of reciprocity and interdependence rather than charity or service provision. Examples of interventions that may be delivered on this front include: community care collectives providing daily living support, skill-share support groups on independent living techniques.
- These networks may offer structured training in leadership and advocacy skills to engage in priority areas with a diverse array of stakeholders, as well as anchor mentorship programs pairing experienced advocates with emerging leaders and supporting the building of policy dialogue channels for local and national changes.

- Towards building these networks, initiatives can take the form of fellowship programs providing visually disabled organisers to develop community initiatives, systematic leadership development programs that combine political education, organising skills, and movement history or a small grants program for disabled-led grassroots initiatives.

Support Family Engagement Programs

Families are significant partners in fostering community inclusion and targeted interventions that offer education about capabilities and potential, address overprotective tendencies, and offer practical guidance on building independence are required. These interventions need to have differentiated modules for various relationships in the family network (parents, siblings, extended family) across different life stages.

- Interventions may take the form of counseling support to help families process their own emotions, moving from protection to liberation, challenging internalised ableism while building relationships of care and interdependence.
- Group-based initiatives that build extended care networks that reduce isolation while respecting people's autonomy may also be useful as also regular spaces for families to share, process and reimagine relationships and expectations.

Enable Access to Pro-Bono Legal Support and Community-Driven Litigation

A network of legal professionals trained in disability rights law to provide pro-bono support for cases involving disability discrimination and rights violations may be supported to incrementally move towards better realisation of accessibility compliance and, therefore, community participation as envisaged in the RPDA 2016. This may include developing partnerships with law firms and legal aid organisations, creating training programs for lawyers on disability rights legislation, and maintaining a database of precedent-setting cases. Supports for community-driven litigation that advances systemic change are needed in addition to those that pursue individual accommodations.

Integrate with Mainstream Community Programs

Develop mechanisms to incorporate visual impairment awareness and inclusion into existing community development initiatives rather than creating parallel disability-specific programs. This includes working with local governance bodies, educational institutions, healthcare providers, and community organisations to embed disability inclusion in their regular programming. Provide technical support and training to mainstream organisations to build their capacity for inclusion. Create toolkits and resources for various sectors to implement inclusive practices.

Foster Cross-Sector Collaborations

Investments are needed towards programs that create incentives for organisations to work together rather than in silos and build structured partnerships between disability organisations and mainstream sectors across education, health, employment, sports and community development. This should include establishing formal collaboration frameworks, creating joint planning mechanisms, sharing resources and expertise, and developing integrated program models.

Physical Presence and Movement – Reappropriating Public Spaces

The daily occupation of public spaces by people with visual impairments needs to become a norm rather than an exception.

- The perception of public spaces needs to move from mere utilitarian aspects of navigation to zones of natural social and economic transactions in which people with visual disability have a legitimate stake. This can take the form of interventions that encourage visible presence in parks, shopping areas, cultural venues, and community spaces, shifting the onus from mere access to intentional occupation. Examples of interventions may be regular social events planned with access, mutual support groups organised around shared interests/identities, organising sports events in public parks and setting up accessible game zones in community areas.
- Public spaces can be appropriated as platforms for cultural expression by people with visual impairments through performances, art installations, or community events.
- The right to protest, participate in public gatherings, and be politically visible needs to be actively supported for people with visual impairments. This includes advocating for accessibility at political rallies, public consultations, and community meetings such as the grama sabha.

Integrate parasports in inclusive education institutions

Inclusive education needs to be anchored from the perspective of shared experiences, rather than simultaneous participation by all students. Para sports that require specific equipment, rules, and skill sets may within educational environments have their own dedicated space, gatherings and recognition. Both adaptive and conventional sports can thrive independently being valued at par within the school community. This approach may also build the perspective that inclusion is about celebrating diversity, in this case distinct pathways to play and sport.

Financial Inclusion

Advocate for regulatory standards with higher threshold compliance requirements, audit mechanisms and enforcement protocols

The RBI has issued several directives to enhance the accessibility of banking infrastructure, but these well-intentioned measures lack the depth and teeth necessary for institutions to adhere in a manner that translates into actual practical value for the customer with vision impairment.

- Advocacy with the Reserve Bank of India is necessary to establish more stringent regulatory standards akin to cybersecurity compliance expectations to move towards financial inclusion for visually impaired individuals.
- Measurable accessibility metrics that assess from the point of view of practical use to customers need to be developed alongside standardised performance benchmarks for physical and digital banking platforms and customer service channels. Further, a baseline may be established against which progress may be audited for accessibility compliance across the banking sector.
- It is essential to implement mandatory third-party accessibility audits across all banking channels – digital and physical - with specific evaluation metrics that evaluate accessibility from the perspective of not only technical adherence but also practical usable.
- Financial institutions may be necessitated to submit accessibility reports encompassing everything from ATM interfaces to mobile banking applications. Recognition incentives for institutions that exceed accessibility benchmarks, penalties for non-compliance and deadlines for

Advocacy for Insurance Coverage

Approach of insurance companies towards people with vision impairments needs a fundamental shift away from current default notions of the disability as a risk. The current insurance landscape has restrictive policies, inadequate coverage for assistive devices, and limited accessibility in the application process. Inclusive policies that address the specific needs of visually impaired people in different socioeconomic contexts need to be developed and advocated for to enable a more equitable insurance ecosystem.

Institute accessibility certification for financial technology solutions

- An all-India level accessibility certification for financial technology solutions may need to be established by advocating with the government to work in tandem with existing RBI guidelines and UPI standards to ensure clear norms for everything from banking apps to payment terminals.
- The certification may be developed through a partnership between the IRDAI, RBI, NPCI, disability rights organisations, and leading fintech companies. Integrating this sort of national certification process into existing fintech regulatory frameworks may support the enablement of a strong market incentive for financial institutions to adhere to accessibility.

Deliver training modules aligned with accessible service delivery standards for customer-facing banking personnel

Vision impairment sector players need to foster partnerships with banking institutions to develop and deliver training modules that transform how front-line staff interact with and serve customers with blindness and low vision.

- These modules should cover value foundations that support perception shift in the minds of the banking staff away from paternalistic notions to view people with vision impairments as customers with equal entitlements. Practical scenarios need to be embedded in these modules to help acquire skills in offering appropriate assistance without compromising customer dignity or independence.
- Regular refresher courses, quarterly assessments, and feedback mechanisms from customers with vision impairments should be built into a broader capacity development framework to ensure that lived experiences are accurately reflected and that continuous improvement is achieved.

Implement community-based financial capability programs - Create accessible financial planning tools and resources and financial counselling networks

A community-based program with three interconnected components may be developed and implemented to increase financial knowledge and planning towards self-directed inclusion among those with vision impairments:

- Development of accessible financial planning tools in multiple formats (audio, screen-reader compatible, regional languages, and simplified content) and in local languages
- Creation of a network of trained financial counsellors (leveraging existing infrastructure such as Bank Mitras and SHG groups) with expertise in disability-

inclusive financial planning

- Building peer support groups that combine financial education with practical skills such as digital payment navigation and banking app usage.

Accommodation standards that support people to perform roles

There is currently a deficit in comprehending a scalable model for what an inclusive workplace looks like in the sector, partly driven by misinformed notions of disability but also because employers are often unclear in how to approach personalised supports in the context of vision impairments.

- There is a need to develop and establish a common framework of accommodation standards with associated capacity building for organisations to establish clear, proactive mechanisms that transcend basic compliance to create truly enabling work environments where people with vision impairments are supported sufficiently to perform their roles.
- The development of accommodation standards needs to be supported, therefore, by two interconnected components: first, pilot implementation with select employers across IT, banking, and professional services to demonstrate successful models, and second, knowledge dissemination and advocacy, including research documentation and creation of open-source resources for broader market adoption.

Mentorship and Career Progression Pathways

- Both employers and education institutions need to offer medium- to long-term programs that pair people with vision impairments in their higher education to employment transition phase with mentors who can support them in the transition phase as well as ongoing career advancements. These mentors may be a mix of senior leaders with disabilities or professionals from the field that someone is interested in pursuing.
- Developing career progression pathways through mentorship may include, in addition to strategic advice and one-on-one skills training, advocating opportunities for cross-functional experience, networking opportunities with industry peers, and helping employees negotiate for performance evaluations based on capabilities over visual-centric traditional indicators.

Cross-Disability employment training and skill enhancement focused on exceeding standards and expectations

- Employment programs must transcend disability-specific silos to adopt a cross-disability approach.
- Workplace conversations for those with vision impairment must center their purpose, aspirations, competence and contribution. To achieve this, training programs must prepare participants beyond basic competency to develop attitudes and standout expertise in their chosen fields, making their skills impossible to overlook.
- Priority must be accorded to training programs that elevate candidates' skills to exceptional levels and shift the narrative from accommodation to achievement.

Demonstration models – “seeing is believing”

Across the gamut of potential employers that the sector seeks to influence, opportunities need to be created to demonstrate potential of those with vision impairments at work.

- Creating structured internship programs that evolve into full-time positions may offer the opportunity for organisations to experience firsthand vision impairment in the work context. These "seeing is believing" opportunities are important cultural translators, breaking down preconceptions and building acceptance.
- Successful placements may be disseminated, creating a ripple effect where one success story catalyses multiple opportunities across different organisations.
- Companies that successfully integrate visually impaired employees may be offered platforms to share their experiences through panels and case studies to inspire and guide other organisations.

Manufacturing unit with cross disability employee teams

The Worth Trust model demonstrates the viability and effectiveness of diverse manufacturing teams as competitive business operations. By creating mixed-ability production teams, organisations can leverage diverse perspectives and abilities complementing each other in a manufacturing environment, in a manner that helps achieve optimised workflows while maintaining high quality standards.

Internal Advocacy and Navigation Support

Employees with disabilities can serve as the most important means of change from within organisations. Opportunities to influence policy, culture, and practices are far more reachable for internal employees who are embedded in the organisation culture and process, something that external consultants cannot achieve. Internal advocates additionally can serve as role models and practical guides and mentors for new employees with disabilities, and continuously push for progressive changes. Recognising these internal advocates and incentivising them appropriately for these roles may in the longer run achieve more sustainable shifts in inclusion practices within organisations.

Future-Ready Skill Development

- Prioritise employment programs that prepare candidates by developing future-ready skills that align with emerging market demands.
- Programs need to function with the dynamism necessary to continuously update their curriculum to reflect changing industry needs, ensuring that participants are prepared not just for current opportunities but for future workplace evolution.
- Programs must singularly focus on sustainable and transferable skills that remain valuable across different employment contexts over a period of time.

Assistive Technology

Sustainability considerations to be integrated into all aspects of assistive technology development and implementation.

This includes financial sustainability through appropriate business models, technical sustainability through robust support systems, and social sustainability through community engagement and ownership.

- Long-term sustainability requires building local capacity for technology maintenance and adaptation, ensuring that solutions can evolve with changing user needs and technological capabilities.
- There needs to be the recognition that building product is the last part - training, repairs and service is larger part, which needs widespread partnerships and that ecosystem to be fostered.
- AT needs individual customisation and distribution programs, therefore, need to incorporate need identification, customisation and then distribution. There is a need to develop a cadre of professionals who can do this.
- More organisations in the space that can handle go-to-market for AT companies need to be cultivated

Social perspectives in Engineering education and practice

Engineering education and practice needs to move beyond purely technical solutions to immerse and engage with social perspectives and lived experiences. Successful assistive technology design requires substantive engagement with disability communities, understanding their diverse needs, preferences, and daily challenges. This participatory approach helps bridge the gap between technical capability and practical utility, ensuring that solutions enhance independence and dignity rather than introducing irrelevant solutions or inadvertently creating new barriers. Engineering education, therefore, needs the incorporation of social perspectives and methodologies that allow for engineers to understand the social, cultural, and environmental contexts in which assistive technologies operate. For ableist assumptions that pervade typical technological solutions to be challenged, one needs to embed within the curriculum the approach to design from a disability justice lens.

Increased focus on long-term funding strategies that account for training, support, and continuous improvement.

Long-term funding cycles for assistive technology initiatives with a structured approach that aligns with practical development periods while measuring impact feasible for each cycle are perceived as critical to the sector.

- The primary funding framework may operate on a three-tiered temporal structure with seed funding for initial development and proof of concept (24 months), implementation funding for scaling and deployment (36 months), and sustainability funding for long-term operations and improvement (60 months). This stepped approach may assist with continuous resource availability while maintaining accountability through milestone-based disbursement.
- The funding mechanism may include provisions for quick-release supplementary grants that cushion the effects of unforeseen challenges or help quickly capitalise on emerging opportunities.
- The other model one can consider in this space is a large charitable corpus grant (e.g. a 100 crore corpus with no returns expected to donor) which may be deployed as part interest-free debt partly as equity. Such funding models may offer the security cushion needed for AT to truly audaciously pursue their purpose without any constraints.

Substantive user engagement models and comprehensive research into the specific needs and contexts of visually impaired individuals in India to inform technology development and implementation strategies.

- To create effective assistive technology solutions for visually impaired individuals in India, organisations may implement a multi-layered engagement strategy that combines participatory design workshops, longitudinal field studies, and community-based feedback loops. Part of this may include regular immersion programs where development teams spend significant time observing and understanding users' daily routines across different contexts - from educational institutions to workplaces and homes.
- Additionally, organisations may implement recursive documentation process of capturing user experience - ensuring that insights are incrementally incorporated into future development cycles.
- This comprehensive approach may be supported by a robust data collection framework that tracks both quantitative usage metrics and qualitative impact measures over extended periods, allowing for evidence-based refinement of solutions.
- The integration of agile methodologies within accessibility-focused development requires a reframing of how sprint cycles and deliverables may be aligned with iterative processes required for teams to engage in meaningful field immersion and observational research. Development teams may need to gain an experiential understanding living with vision impairment beyond surface-level accessibility requirements to address the nuanced ways in which visual disabilities intersect with daily technological interactions.
- Business models must recognise that meaningful community-based interventions require sustained engagement with visually impaired communities and therefore commit to financial investments that value and resource extended periods of qualitative research, participant observation, and co-design activities.
- An entirely user led and incorporated AT incubator, where people with disabilities are the core decisions makers, may be the disruptive investment needed in this space

Innovative business models that can balance affordability with sustainability in the Indian market context.

Market development requires innovative approaches to address the unique challenges of the Indian context.

- There is a need to develop flexible pricing models that balance affordability with sustainability, creating public-private partnership frameworks that can leverage

governmental and private sector resources.

- Special attention should be paid to developing financing mechanisms that can make technologies accessible to users across different economic segments.

Enhanced efforts in training and awareness programs to ensure that both users and educators are equipped to maximise the benefits of assistive technologies.

- Training and capacity-building programs need to be developed with a long-term perspective, focusing not just on immediate technology usage but on creating a sustained capability for adaptation and evolution.
- These programs should address the needs of multiple stakeholder groups, including users, support personnel, trainers, and technology developers. The training methodology should incorporate both structured learning modules and practical, hands-on experience.

Policy reforms and government initiatives that provide better support and incentives for the development and adoption of assistive technologies.

- Policy reform and regulatory support, such as tax incentives, can make technologies more affordable. Developing comprehensive accessibility standards can drive adoption across sectors. Targeted government funding can support sustained research and development.
- Policy frameworks should also address the need for standardisation in technology development and implementation, ensuring compatibility and interoperability across different solutions.

Integration of accessibility features into mainstream technology products and reducing costs through economies of scale

- Manufacturers should prioritise the integration of fundamental accessibility features into their existing product development lifecycle. Basic screen reading capabilities, voice command interfaces, and haptic feedback systems need to become standard features rather than specialised additions.
- In this context, manufacturers can consider architectures that may offer flexibility for accessibility features to be selectively activated without requiring substantive hardware modifications. Per-unit cost of assistive technology can be reduced by such integration of accessibility features into mainstream product lines as such an approach

would leverage existing production infrastructure, distribution networks, and service channels, eliminating the need for separate specialised production lines.
- Manufacturers may focus on production lines that find viable markers among both visually impaired users and the general population, thereby distributing development and production costs across a larger user base.
- Manufacturers can also introduce dedicated AT verticals within their operations and business mandates

Center end users in the purchase dynamics

Some measures can be undertaken to resolve the disconnect between those who buy the AT (institutions) and those who use the AT.

- Direct-to-user distribution channels may be established within institutional frameworks to maintain financing while improving choice.
- Coupon or voucher-based systems may give end-users direct purchasing power while maintaining institutional funding frameworks.
- Institutional buying policies may include user satisfaction metrics as key performance indicators alongside traditional cost considerations.
- Open-access platforms that aggregate user reviews and pricing information may be developed to inform buying decisions.

Accessibility - Advocacy

In order to push the envelope for increased accessibility, it is critical to look at building advocacy programs in the space. Some of the recommendations for the same are:

- Build a heightened awareness about compliance amongst the various stakeholders rather than bringing this awareness through litigation.
- Empowering individuals and organisations that are doing grassroots-level legal work. As a respondent shared

> "Ultimately, you need strong legal mandates for things to be put in place across the board. And then everybody will begin to comply. Funding agencies also need to build this understanding of what will lead to a higher degree of compliance with our laws and support those legal advocacy initiatives."
>
> - *R 29, Lawyer, Founder, Legal Advocacy and Accessibility Organisation*

- There is a need to build more robust programs around accessibility-related legal interventions, making legal aid easily available on a pro-bono basis to people with

disabilities for disability rights violations.

- There is a need to build a program for training lawyers in disability law to improve the quality of debate and better interpretation of law and the availability of quality lawyers.
- There is also a need to build digital accessibility indexes and frameworks to bring in standardisation in testing and implementation.

Having looked at recommendations for the specific areas, there have also been some broad-level recommendations related to structuring program design and impact that are worth noting.

Program Design Ideas

Project Duration

There has been a consistent call to look at work in the sector on a long-term basis. As shared by a respondent,

> "The problem is complex, and technology is moving very fast. Bridging decades of gaps is a huge task. No one has a clue of what timelines we are looking for."

- *R17, Social Sector Leader, New Generation Disability NGO*

Within this context, all respondents unanimously called out that any project needs to operate on a minimum five to ten-year timeline.

This ensures that programmes do not get trapped in the funding duration cycles.

Program Ideology and Team Structure

It is critical to build programs based on an empowerment mindset rather than a charity mode. Those who are only driven by the distribution of devices to meet the target number of beneficiaries tend to lean on the latter, impacting long-term change. NGO partners themselves need to be sensitised for the same.

It is also important to look at disability projects and programs located from wider community-based or education programs rather than exclusive disability projects. A more interdisciplinary team working with diverse skill sets are more useful as well rather than an overfocus on disability skills alone.

As a respondent shared,

> "A wider outlook has definitely helped us rather than an

> exclusive disability focus. When you work with all, then people with disabilities automatically get included."

- *R10, Senior Management Representative, Community Organisation also inovled with inclusive education work*

The interdisciplinary nature of the team is also needed from the perspective of closeness to the issue. As a respondent shared, their model of work encourages social entrepreneurs to adopt what they call the Frogs-Beavers and Eagles approach.

> "Frogs are people with lived experiences of the problem, they come from the problem and can jump out of the same to find a solution. Beavers are those who are connected but not directly impacted and Eagles are those who are researchers and thinkers who may not be directly impacted or connected but provide a wider perspective. All are needed. Eagles can have a neutral perspective compared to the very passionate Frogs. Frogs can have great clarity on what they stand for and not corrupt their ideas."

- *R23, Founder, Social Entrepreneurship Organisation and School for Blind, Lived Experience*

But only when we have this kind of diverse viewpoint-based teams, can balanced, pragmatic and effective solutions be designed.

Programs need to advocate for diverse and interdisciplinary teams.

Frameworks for User Engagement in Program Design

There has been a consistent need expressed to ensure that users are part of program design across all areas of work. Due to the fundamental gap areas in awareness, it is essential to ensure that user groups are not only part of feedback but also the design process. One needs to attempt to ensure that users are part of leadership and strategy teams. At the same time, one also needs to ensure that individual lived experience-based bias does not seep into user feedback.

There is an additional concern related to financial loss to the user community when they are part of feedback processes and challenges faced by program and product developers in finding users.

It is critical to lead and build a framework and ecosystem of user engagement. There is a need

for initiatives that support those with vision impairments to garner institutional power, shape priorities and direct resources. Meaningful participation of people with visual impairments in program design and leadership roles across varied sectors and domains may be promoted via a model that envisages establishing paid positions for user engagement within organisations and associated compensation structures for consultation work for accessibility or allied priorities as lived experience experts.

This could be done in multiple ways.

- All programs to keep user engagement positions have them built in budget lines.
- Create user networks and ways to connect them with relevant program and product developers
- Facilitate more skill and higher education opportunities for persons with blindness and low vision to have more varied skill set users available to be part of program, strategy and development teams.
- Look at user engagement as a professional opportunity rather than only pro-bono voluntary services.

Supporting Organisation Capacity Building

For programs to be effective, one also needs to look at and strengthen the organisational capacities of delivery partners beyond just knowledge and subject expertise. Organisations themselves could be in a better position if they received necessary capacity-building support. Some of the areas that organisations can benefit from, as shared by the respondent, are,

> "It is important to get support to build a five-year strategic plan for our organisation and then decide what support fits into our plan. So we can say yes or no more in alignment with our vision and those that fit the strategic plan. Otherwise, sometimes working on different projects overwhelms, and it becomes an overdose for teachers."

- *R10, Senior Management Representative, Community Organisation also inovled with inclusive education work*

Facilitate Networks

There is a need to take a macro national level strategy approach to work in the sector to have a long-term impact. Given the diversity and complexity of the issue, no one organisation can address this. At the same time, there is an urgent need to weave a collective long-term strategy and bring in various stakeholders to contribute to the same.

This itself is a much-required project in the sector whose very aim would be to build this national-level program. This project could be jointly hosted by a funding partner, an implementation partner, a technology company, mainstream social sector organisations, government representatives and have a program secretariat to lead the initiative.

There needs to be a macro holistic plan that incorporates all the diverse areas of work across the lifespan and has multiple partners plugging into the various components.

There is also a critical need to have a multidisciplinary approach in bringing diverse sector expertise to such a think tank process from diverse sectors of industry, technology, education, health, and sports instead of restricting it to only disability sector organisations and assistive technology companies.

We need to shift the view of the work in the sector to an inclusive approach rather than a speciality-driven approach. Similar to the integration of the inclusive and special education integration discussed earlier.

As a respondent shared,

> "Can the NGO sector keep a common plus curriculum framework and have a 10-year horizon and 25 organisations can agree on the same?"

- *R10, Senior Management Representative, Community Organisation also inovled with inclusive education work*

As another respondent shared,

> "Newer collaboratives are needed. Same conversations are happening, and we need to make the sector more active."

- *R17, Social Sector Leader, New Generation Disability NGO*

Building India Relevant Research and Knowledge

There is a significant dearth of India relevant research in the field. It is critical to build India-relevant rehabilitation programs, document them and build channels of sharing this information amongst the community.

The disability studies group within India is not actively involved in program building within the sector. A dialogue between practitioners and academicians also needs to be built to create more knowledge-driven practices for the field.

Reimagining CSR

Many ideas were shared on how NGO partners would like to envisage CSR initiatives to enable them to increase the impact of their work. Some of these are listed below:

- Reimagine CSR as the highest form of risk capital that has the potential to bring in change and impact at an exponential scale. Any risk capital keeps a long-term horizon rather than immediate results. CSR programs can borrow from those models to select and execute projects. Program design and monitoring would then look very different.
- Build CSR Networks that call for collective meetings between diverse CSR players and implementation organisations where the latter can share ideas with CSR programs about what the needs of the sector are.
- CSR Practice Transformation- Where the focus of monitoring and review is not based on micro rigid details but on co-building a program together. It is also crucial to keep the CSR purpose of a company independent of its business motive or other HR roles. Care must also be taken to ensure that CSR programs do not become the channel through which the company promotes their business products by making it mandatory for CSR partners to use their products and services. As a respondent shared

> "CSRs tend to look at supporting urban areas because they want to run employee volunteer program when the focus should shift to rural as well."

- *R 12, Social Sector Professional, Disability NGO*

- Acknowledge the core issue being addressed is extremely complex and to be realistic in speed of change is expected. One is operating on a society-level issue where the constant experience, as shared by a respondent,

> "For some mindset is so horrible that it will never change. But we can work with those that are willing to change. There will be early adopters, then the early majority who will follow and some who will never change."

- *R 28, Social Entrepreneur, Employment Organisation*

- CSR programs also need to change their matrix of looking at quality as an equal indicator to quantity. When funds are directed to large-scale programs also government programs that guarantee quantity at a low per capita cost, it is critical to realise that quality and long-term impact are being sacrificed in many of the cases.
- CSR program building an active within company inclusion and accessibility agenda. It is critical that in the space of inclusion and accessibility, CSR programs beyond funding should be able to drive action within the organisation as a project itself. Whether it is to

make their products and services accessible, become an inclusive employer or use their corporate expertise to support ground-level initiative and their social capital to drive government-level advocacy

Measuring Impact

Measuring the impact of inclusion and accessibility programs, like many other social sector initiatives, has been a challenge. Several interesting ideas have been shared by respondents for the same that are listed below:

- Focus should be on quality and not just quantity. There was a unanimous agreement on

> "Numbers don't work, qualitative change in the lives of individuals needs to be looked at. Depth matters, not breadth."

- *R16, Social Sector Leader, International Disability NGO, Lived Experience*

- There is a need to begin the work on building sector frameworks for monitoring progress. What should be the indicators for baseline and end line and progress tracking? All programs should be expected to track and use the data to refine frameworks.

As a respondent shared:

> "Tracking helped us to understand why some students took exams on the computer, and others did not. Parents had apprehension of low performance. We were able to give data and change that perception. During tracking, we found that blind teachers were most resistant to change because they were used to braille and old methods. Sighted teachers adapt to mainstream technology more easily."

- *R16, Social Sector Leader, International Disability NGO, Lived Experience*

Such insights through tracking can enable us to not only improve programs but also build more relevant work indicators of impact.

- Through the research, respondents shared their ideas of what 'impact' would mean to them. Some of the key ideas are shared by respondents:
    - Employability readiness at the end of the education program. Build an education program to achieve that.

- Where a child can do everything that another child without that disability can in a school. Able to adjust to the classroom, seek education and get information. Navigate through technology, engage with the world, is independent, interested in studies, is self-sufficient, can raise complaints, interact with people, classroom participation is increased and eventually, there is improvement in scores.
- How does the intervention change somebody's life? Participation across life areas. Have I changed your outlook? Do you ask for more things? For example, children now ask their parents for a certain kind of food, and engage with more people. Do they talk more when guests come home? Are we still left with I'm hungry, I am thirsty or do we have kids who are saying I want my dosa crisp?
- Financial and social independence.
- Inclusive education is not the goal, inclusive society is.
- Find a way to acknowledge the legacy impact of legal change as a result of advocacy as impact.
- Can information about new AT reach end users within two weeks rather than twenty years?
- Literacy - Read and write both in braille and digital.
- Same outcomes as the NEP. Are children learning and becoming lifelong learners
- Success for companies should not be recruiting PwD but recruiting people with disabilities.
- Go to saturation mode to reach all children in a block/village along with the level of engagement. What type of engagement is happening?

Based on the multitude of discussions, both on gap areas and recommendations, if a few dream projects had to be built for the area, what would they look like? When we asked this to our participants, we had some very interesting ideas. And as a conclusion of this chapter, it is apt to share those ideas here.

What would Dream Projects in Space look like?

A University for Stakeholder training

Train the trainer university across all stakeholders, with a clear career path for those trained. Build a supply chain system for the same by creating an ecosystem of organisations, schools, and CSR programs that work in the space.

This training university can also look at multi-stakeholder training including NGO Capacity Building. How to build effective organisations, hire, train and manage human resources within organisations are critical areas of capacity building that many NGOs struggle with.

Rural India Last Mile Program

Creating models and support systems for rural India. Rural area education reach. Build last-mile

connectivity to the student through a cross-disability yet differentiated disability ground operation model. Administrative management structure can be common for cross-disability but within that specialists are available for intervention. Build community ownership to address inclusion by using community volunteers. Integrate inclusion programs within the wider village development program. Get rural schools and special schools to run AT and STEM labs. Merging availability and training of AT within the same location.

Dream School Project- School of Excellence

To transform education for children with blindness, we need an out-of-the-box idea to break the frameworks that have lasted decades.

Respondents spoke about building a school of excellence. A place that fosters a sense of self-worth in students and faith in their dreams. As a respondent shared,

> "Anyone with a task has a value. If you have value you are respected, you get dignity and only then self-confidence will come. Schools need to have Dream Factories. A place where students are asked What do you want? And then provide support for those dreams rather than boycott them. Listen to what people want and be a facilitator for them."
>
> Teachers should be recruited based on whether they are willing to see this as an adventure and challenge and not a problem. Those who are willing to listen to kids. Build programs based on what the kids are saying. View teachers as catalysts and students as participants, not as teachers and students. See both at the same level."

- *R23, Founder, Social Entrepreneurship Organisation and School for Blind, Lived Experience*
- *R24, Founder, Social Entrepreneurship Organisation and School for Blind*

A school like this can be viewed as one that runs a 2-3 year preparatory course that eventually leads to students' self-integration into mainstream schools. Students continue to use the school for boarding and lodging in cases where this is needed.

The same ideas can also be run in the form of summer camps.

Training program for persons with blindness and low vision

Training camps across all age groups for students with early intervention. Training can focus on the foundation of braille, early learning methods, digital literacy, and mobility. This will pave the way for good quality education, employment and quality of life.

A respondent shared a new idea of Universal Design,

> "Build a model university from school all they up to higher education, which is designed for people with blindness but usable by all. Build it for people with disabilities and if you are someone without a disability you can also get admission."

- *R 31, Researcher and Assistive Technology Professional, Assistive Technology Centres*

Higher Education Access

Get more people with blindness and low vision into quality institutions of higher learning. This will not only increase their access to pursuing the careers of their dreams but also create effective role models and change the narrative of disability. It will also increase the skill set of people available to be leaders, decision-makers, and developers.

Launch Mass-Scale Professional Awareness Campaigns

Awareness that engages in systematic cultural work to challenge ableist assumptions and celebrates diversity is most critical. Build a mass-scale national-level, large-scale sophisticated, professionally-created awareness campaigns using mainstream media channels and social platforms to reach all segments of society to shift sedimented social imagination of those with vision impairments. One that is created by the most professional media and advertising agency. One that can reach every citizen of India and change the narrative on disability at a national level. Build exposure to regular people with disabilities, not just exceptional people. Get persons with blindness involved in building the change they want to see. Engage people in telling their own stories, showcase everyday situations - at work, in social settings, and participating in community life - to regularise their presence and capabilities rather than inspirational or tragic narratives.

AT Ecosystem

Use the ecosystem of large-scale corporate houses for building the AT sales, manufacturing and repairs ecosystem through their existing product channels. Build corporate and National Skill Development Council (NSCD) training partners to create a supply chain pipeline for employment. Ecosystem development demands the formation of strong collaborative

networks between technology developers, educational institutions, NGOs, and government bodies to foster collaborative creation of knowledge repositories that can aid incremental learning and implementation across regions. Furthermore, the ecosystem should prioritise the development of support systems that can sustain long-term technology adoption and usage.

Research and Advocacy

Invest in research on education pedagogy, low-cost education resources, and inclusion implementation in various contexts. Much is desired in understanding how people with blindness learn and experience the world.

Along with research, also work on active advocacy work with a government that looks at building common educational guidelines across states, gets states to mandatorily make their educational content accessible, builds effective teacher training for Sarva Shiksha Abhiyan (SSA) etc.

Our Recommended Next Steps

Based on the many ideas, and recommendations, in this final section of the report, we seek to summarise a consolidated priority area of the next steps.

Step 1: Facilitate an idea lab through organisations like Kanthari to build a national-level macro collective plan for the sector. Kanthari has been doing exceptional work in building social entrepreneurs, and with their disability sector connection, they would be an excellent group to facilitate such a process.
Step 2: Work towards a consortium-based funding model that can encourage the different stakeholders to collectively work towards a common vision
Step 3: Build a program with the approach of: a. Identify exemplar projects already working and support the development of replication toolkits b. Build new evidence-based niche experiments where new ideas need to be experimented

Step 4: Top 5 Focus areas for programs:

a. Transform School Education by building a school of excellence model (Reference in dream projects)
b. Community-based holistic last mile connectivity program that looks at all aspects of inclusion (through adopting a village model in partnership with local community organisations)
c. Cross-stakeholder capacity building university (Reference in dream projects)
d. Awareness – Mass scale innovative national level campaign (Reference in dream projects)
e. Advocacy – Across education, health and financial access to encourage compliance-based government frameworks

Next priority areas:

[5] Building a higher education and employment pipeline for students who graduate
[6] Transform AT conversation to making technology born accessible through mainstream tech and product developers along with a user-integrated AT incubator for specialised products.

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