Situating Access Work in the Land of Jugaad: A global South retelling of technology-mediated education for children with visual impairment

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Various approaches have informed the design of technology-mediated education for people with disabilities, including Universal Design for Learning (UDL), Disability Interaction (DIX) principles, and Crip Technoscience, each bringing valuable insights into accessibility and inclusion. Bridging insights from these approaches spanning HCI, Disability Studies and Education Research, Accessibility4Equity framework emphasize the value of collaboration between educators and disabled people; to push for born accessible learning environments through appropriate technology and pedagogy approaches; and capacity building among institutions to imbibe access intimacy so as to quickly address community needs. In this paper, we contribute to this discourse in two key ways: first, by revisiting A4E from a Global South perspective to explore how its tenets materialize in resource-constrained, community-oriented, and linguistically diverse educational contexts; and second, by expanding the framework through the concept of jugaad access, a frugal, context-responsive approach that foregrounds improvisation and adaptability in the face of systemic limitations. To undertake this inquiry, we employ Collective Memory Work, a collaborative, reflexive method that foregrounds situated knowledge and shared interpretation, to analyze three long-term interventions: an audio-labelling tool for tactile graphics, a content delivery platform for braille displays, and a Digital Literacy curriculum for children in special schools. Our analysis identifies three interrelated strands of equity-oriented design: (1) the diverse and situated ways in which co-creation is practiced among diverse actors, , and the ways in which these collaborations can be intentionally structured into interventions in the Global South; (2) intentional efforts to redistribute power and foster collaborative agency across the intervention ecosystem; and (3) the emergence of jugaad as a critical design sensibility that reimagines "born accessible" ideals through incremental, adaptive practices grounded in local realities. Together, these findings offer conceptual and methodological insights into how equity can be meaningfully operationalized in accessible education across the Global South.

CCS Concepts: • **Do Not Use This Code → Generate the Correct Terms for Your Paper**; *Generate the Correct Terms for Your Paper*; Generate the Correct Terms for Your Paper; Generate the Correct Terms for Your Paper.

Additional Key Words and Phrases: Do, Not, Us, This, Code, Put, the, Correct, Terms, for, Your, Paper

ACM Reference Format:
Anonymous Author(s). 2018. Situating Access Work in the Land of Jugaad: A global South retelling of technology-mediated education for children with visual impairment. In *Proceedings of Make sure to enter the correct conference title from your rights confirmation email (Conference acronym 'XX)*. ACM, New York, NY, USA, 22 pages. https://doi.org/XXXXXXX.XXXXXXX

1 Introduction

Disability is not merely a biomedical condition but a complex and situated social experience that shapes and is shaped by access to infrastructure, education, and opportunity. Globally, over two billion people are estimated to have some form of disability, with this number projected to rise, particularly in developing countries [69]. In India, the 2011 Census recorded approximately 27 million people with disabilities [1]—a figure expected to increase significantly by 2050 [13]. Among this population, visual impairment constitutes a substantial proportion: 285 million people worldwide are

Manuscript submitted to ACM

visually impaired, with 90% residing in developing countries. India alone accounts for 39 million blind individuals and 246 million with severe or moderate visual impairments [36, 37]. Despite these significant numbers, an estimated 40% of visually impaired children in India lack access to education, particularly in fields such as science, technology, engineering, and mathematics (STEM), where visual information plays a critical role. These figures underscore the urgent need for context-aware, technology-mediated educational tools and programs that are responsive to the specific learning environments and needs of blind and visually impaired children in India, which actively move us toward more equitable educational futures.

Given its inherently interdisciplinary nature, the field of Human-Computer Interaction (HCI) has seen growing calls from accessibility scholars to engage more deeply with insights from Disability Studies [34, 42, 46, 63, 66] and Science and Technology Studies (STS) [9, 10] to inform the design of socially just technology-mediated educational tools and programs for people with disabilities. Approaches such as Universal Design for Learning (UDL), rooted in education research [30], and access intimacy, grounded in disability studies [16, 31, 32], have shaped how equity is conceptualized. The Accessibility4Equity (A4E) framework offers a holistic approach to understanding equitable educational technologies by bringing together these diverse disciplinary perspectives into a unified analytical lens [58]. It captures the messy entanglements of human and non-human actors in designing technology-mediated learning environments. Core tenets of A4E emphasize the value of collaboration between educators and disabled people ; to push for born accessible learning environments through appropriate technology and pedagogy approaches ; and capacity building among institutions to imbibe access intimacy so as to quickly address community needs.

As researchers situated in the Global South [11], we argue that the complex educational settings of this region offer critical perspectives for extending existing frameworks on equity in technology-mediated education. Infrastructural precarity, linguistic and cultural diversity, and a wide array of actors—including caregivers, special educators, NGOs, technologists, and state institutions—shape the landscape of educational access for disabled children in ways that often diverge from assumptions embedded in dominant accessibility paradigms [45, 52, 59, 60]. Despite constraints, access work persists through situated, adaptive, and often collaborative practices. We therefore ask: **How do the key propositions of A4E materialize while designing for equitable technology-mediated education for children with visual impairment in India?** In this paper, we build on the Accessibility4Equity (A4E) framework in two key ways. First, we offer a conceptual re-engagement with A4E by grounding its propositions in the socio-technical realities of educational interventions in India. Second, we expand the framework by introducing jugaad access: a form of incremental, context-responsive problem-solving—as a way to rethink the tenet of born accessible educational environments. To do so, we draw on Collective Memory Work (CMW) [18, 62] to reflect on three long-term interventions: an audio-labelling tool for tactile graphics, a content delivery platform for braille displays, and a Digital Literacy curriculum for children in special schools. Our findings are organized around three interrelated strands: first, the different ways in which co-creation is enacted across actors, including disabled students, educators, NGOs, and technologists; second, the intentional strategies adopted to diffuse power and foster collaborative agency among these actors; and third, the emergence of jugaad[54–56]—a locally rooted, improvisational mode of problem-solving—as a critical modality of access-making and as an alternative to born accessible learning environments.

[1]Terminology referring to disability varies across contexts and communities. In India, person-first language (e.g., "children with visual impairments") is commonly used in policy and institutional discourse. However, one of the authors of this paper, who is blind, prefers identity-first language (e.g., "blind child" or "blind woman"), reflecting her lived experience and political identification with disability. We recognize that both person-first and identity-first formulations are valid and widely accepted across global contexts. Accordingly, this paper uses these terms interchangeably—for example, "children with visual impairments," "blind students," or "visually impaired learners"—in alignment with context and authorial voice.

This paper makes the following contributions to HCI and accessibility. Firstly, we bring to the fore the unique characteristics such as involvement of diverse stakeholders and resource constraints that undergird India's special education ecosystem. In so doing, we extend A4E to centre global South perspectives while approaching the design of equitable tech-mediated education. Secondly, by situating jugaad practices within access work, we expand on A4E proposition of born accessibility to show how access work is done differently in the global South with an incremental approach acting as a building block towards more equitable, accessible learning environments. Finally, to the best of our knowledge, this study is the first to introduce Collective Memory Work (CMW) to HCI as a methodological approach for retrospectively analyzing the situated development of socio-technical interventions.

2 Related Work

Accessibility and HCI research have long benefited from theoretical and methodological contributions across disciplines such as education, disability studies, and science and technology studies—each offering distinct lenses to understand and design for equity in technology-mediated learning environments. In this section, we draw on two strands of related work that are particularly important for this study. First, we examine how equity has been conceptualized at the intersection of education and technology design, highlighting how frameworks such as Universal Design for Learning (UDL), Disability Interaction (DIX), and most notably, the Accessibility4Equity (A4E) framework, have pushed for more inclusive and socially just educational technologies. Second, we turn to literature on educational inequities in the Global South to foreground the material, institutional, and infrastructural conditions that shape how access and equity are negotiated in practice. These two bodies of work together offer the conceptual foundation for our inquiry, allowing us to both revisit and extend A4E through the lived realities and design challenges of long-term educational interventions in India.

2.1 Equity, Education and Technology Design

In this study, we draw on notions of equity from the domain of education, HCI, and disability studies. Notably, discussions around equity have been siloed across different disciplines [19, 58] and lack a consistent definition [39]. Theoretical fragmentation across disciplines skews our understanding of the challenges around exclusion and the opportunity thereof. We now review some of the equity-centered frameworks across different disciplines.

In the educational realm, which is the core focus of the study, equity aims at various approaches to account for diverse learners and make appropriate accommodations to foster a just learning experience for all. One strand within educational equity is associated with the culturally sustaining pedagogies (CSP) that highlight the need for approaches to rectify opportunity gaps for learners belonging to diverse linguistic, cultural and racial backgrounds [5, 6]. While CSP advocates for teacher preparations and shifts in curriculum and policy, much of the discourse remains rooted in the mainstream education domain with little regard to disability [19], thereby remaining far from equity in its true sense. Yet another strand exploring equity in pedagogical approaches is that of universal design for learning (UDL). Universal Design for Learning [30] emphasizes on variability while designing learning experiences to cater to students with disabilities. In so doing, however, UDL fails to capture the intersectional identities such as culture, language that collectively shape learner experience [26, 58].

Besides education research, we draw on the field of disability studies. Disability studies contribute to our understanding of disability and foreground power dynamics that stem from ableism. Universal design discourse encourages design researchers to design for the widest set of users possible, thereby offering strategies to attain equity [64]. However, Hamraie [31] acknowledges the inherent politics of design and calls for a disability justice approach wherein power and privilege are distributed to those who are subjugated to the matrix of domination. Contrary to the hegemonic narrative, crip technoscience [32] further moves the envelope with regards to equity and disability justice [16] by flipping the disability gaze of the designers to firmly position disability as a desired condition.

Equity has been an integral aspect of designing just technologies. In a systematic review of equity frameworks in HCI scholarship, Kim et al. [39] noted that scholarship on FeministHCI, social justice and ableism were vehicles to explore the theme of equity. For instance, FeministHCI [9] critically interrogates the quest for "universal accessibility", and advocates for plurality and co-creation as a core value to design equitable technologies. Furthermore, recognizing the intersection of cultural diversity, distinct socioeconomic conditions and varied literacies – a Feminist lens encourages designers to eschew the normative conventions that are rooted in Western epistemologies.

Besides FeministHCI, literature on design and social justice also centers on equity as a core value in the design process for fostering fair technology experiences [50, 57]. Towards this pursuit of foregrounding equity in designing just sociotechnical systems, Strohmayer et al. [65] call for unpacking the social, political, historical and legal ecologies through participatory design approaches. Relatedly, Dombrowski et al.[23] also acknowledge the heterogeneous settings wherein communities are situated within unique cultural, historical and political milieu. Tapping into the network of nonprofit organizations, therefore, enables designers to respond to the various unique needs of the community. Doing participatory design work in collaboration with nonprofits ensures the distribution of resources, knowledge, power, and expertise, thereby offering means to address educational injustice. Extending this idea of co-creation in the context of disability, Holloway et al. [34, 35] underscore the wickedness of disability inclusion in under-resourced contexts of the global South where disability is strongly linked to poverty. In summary, HCI has offered several frameworks that foreground equity. While these frameworks inform our understanding of disability inclusion and equitable technology design, Holloway et al. [34] call for *undisciplining*, a radical step towards the advancement of theoretical framework so as to accommodate ideas around specific concepts from different disciplines.

In line with this pursuit of accounting for perspectives from different disciplines, Shaheen et al. [58] propose Accessibility4Equity (A4E), a theoretical framework to examine the disabled youth's technology-mediated learning experiences. Drawing on the field of HCI, Disability Studies, Education and Law and Policy, A4E calls for the design of technologies that are born accessible through collaborative co-creation. Going beyond mere technology adoption, A4E pushes for the idea of access intimacy so that community access needs are swiftly responded to in an individualized manner. In this paper, we reaffirm the core tenets of A4E (as shown in Fig. 1) and expand the framework with a focus on the global South where lack of infrastructure, policy gaps and diverse actors further complicate the idea of accessibility and equity.

2.2 Educational Inequities in the Global South

The term Global South does not refer solely to a geographic location, but to a constellation of communities and peoples shaped by shared histories of colonialism, resource extraction, and structural inequalities in global development [4, 11, 12, 20]. It encompasses low- and middle-income countries in Asia, Africa, Latin America, and parts of Oceania, where socio-economic inequities are often entrenched in postcolonial legacies [24]. These contexts are frequently marked by limited public infrastructure, under-resourced institutions, linguistic diversity, and multiple axes of marginalization, including those related to caste, class, gender, and disability [1, 28, 29, 48, 51, 52, 52].

Within the Global South, disabled children face structural barriers to education that are deeply intersectional. These barriers operate at multiple levels—infrastructural, pedagogical, institutional, and cultural—creating compounding disadvantages that prevent their full participation in the education system [27, 59] . The issue is not merely one of

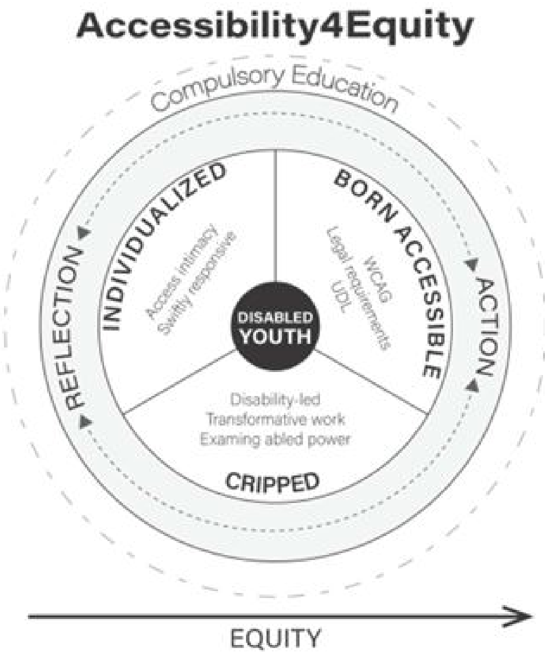

Fig. 1. Core propositions of Accessibility4Equity Framework by Shaheen [58]

access to school buildings, but of systemic exclusion embedded in how education itself is conceptualized and delivered [67].

Many disabled children are denied admission to mainstream schools, with administrators citing a lack of appropriate resources or support systems. Those who are enrolled often find themselves in environments that are physically inaccessible—characterized by stairs, narrow doors, or inaccessible toilets [40] and pedagogically exclusionary, lacking materials such as braille, tactile diagrams, or accessible digital content [41, 61, 67]. Mainstream curricula rarely address their specific learning needs, and where assistive technologies exist, they are often misaligned with local contexts or unaffordable.

In addition to physical and pedagogical inaccessibility, a shortage of trained teachers—both special educators and those equipped for inclusive teaching—remains a critical bottleneck [49]. Educators often lack awareness of disability-inclusive pedagogies or hold ableist attitudes that lower expectations for disabled students [44]. Consequently, even when technologies are introduced, their integration into teaching practices remains inconsistent.

Socio-economic factors further amplify these barriers. Many disabled children come from families where they are first-generation learners and may lack the necessary support structures at home [60]. During moments of crisis such as the COVID-19 pandemic, the shift to online education disproportionately excluded disabled learners in rural and semi-urban settings. With unreliable connectivity, lack of devices, or parents unfamiliar with using digital platforms, many children simply dropped out of the formal learning systems [61].

Language remains another axis of exclusion. When digital content and educational technologies are developed primarily in English, they remain inaccessible to children who speak only regional or Indigenous languages [67]. The absence of content tailored to linguistic diversity creates yet another barrier to learning, especially for children with disabilities who may already face delays in literacy acquisition.

In India, these intersecting exclusions have led to a system where special schools often serve as the only educational space for blind and visually impaired children. While such schools provide important forms of support and community, they too suffer from infrastructural constraints, outdated pedagogies, and limited digital integration [68]. Even with progressive legislation such as the Rights of Persons with Disabilities Act (2016) and the inclusive education component of Sarva Shiksha, the translation of policy to practice remains patchy and uneven [15, 44, 45, 67].

The debate between special education and inclusive education is particularly complex in the Global South, where the ideals of inclusion often collide with infrastructural and pedagogical realities. While inclusive education—defined as the integration of all children, including those with disabilities, into mainstream schools—is promoted globally through frameworks like the UNCRPD and the Sustainable Development Goals, its implementation in low-resource contexts remains uneven and contested. Critics of premature inclusion argue that mainstream schools in the Global South are frequently unprepared—lacking both material resources and sensitized personnel—to provide meaningful education to disabled children. As a result, inclusion in such cases may translate to physical presence without pedagogical participation. On the other hand, special schools, despite their segregationist histories, often offer tailored learning environments, peer networks, and trained educators that are unavailable elsewhere. In India, for instance, many blind and visually impaired children receive their only formal education in special schools, where braille literacy, orientation and mobility training, and independent living skills are more readily taught. Scholars like Singal and Miles argue for a nuanced, context-sensitive approach that recognizes the limitations of both models and prioritizes the development of flexible systems that can draw upon the strengths of each. The tension between inclusive and special education in the Global South thus calls for a rethinking of "inclusion" not merely as physical integration, but as access to relevant, high-quality, and contextually meaningful learning opportunities [2, 3, 8, 38, 47].

This paper draws on the notion of jugaad [14, 55, 56] to foreground these adaptive, collaborative, and locally grounded responses to systemic exclusion. While not perfect or permanent, such interventions become building blocks in the slow and layered journey toward more accessible and equitable education systems

3 Study Context

3.1 Special education ecosystem in India

In India, children with visual impairments primarily attend residential special schools during their early education, usually from grades 1 to 7 or 8. These schools combine academic instruction with essential life skills such as braille literacy, orientation and mobility, and independent living. Teaching in these classrooms relies on tactile and auditory modalities, requiring hands-on, one-on-one instruction. Homework is uncommon due to the residential nature of schooling. Instruction is also adjusted to account for students' varied prior exposure to plus curricular skills, especially for those who arrive from regular schools.

STEM education in special schools remains limited, constrained by inaccessible teaching resources, a lack of teacher training, and persistent assumptions about blind students' abilities—often resulting in a cycle where teachers who missed out on STEM instruction as students now teach without adequate subject knowledge [22]. In these settings, access to educational resources follows a collective model: devices, books, and materials are shared among students rather than individually owned. This differs from the "one device per child" model commonly seen in the Global North

Fig. 2. AT Device

[7]. With limited purchasing autonomy, special schools rely heavily on government funding or external donations, which restricts their ability to procure tools that are tailored to their specific pedagogical needs.

3.2 Overview of the three interventions under consideration

Building on the preceding overview of the special education ecosystem, we now introduce three interventions developed within this sociotechnical context. These interventions are part of the ongoing work of a nonprofit organization, incubated at a research institution in 2017, which aims to make STEM education accessible in special schools across India. The nonprofit addresses three core challenges: the lack of accessible content, limited subject expertise among teachers—many of whom are blind—and the scarcity of affordable assistive technology. In response, it has developed tactile-enhanced Braille textbooks, teacher training programs, and accessible digital platforms in collaboration with academic institutions, multinational corporations, and assistive tech startups. Its approach emphasizes low-resource, play-based learning grounded in accessible design frameworks. Prior publications from this body of work are withheld here for anonymization.

3.2.1 Audio-labeling Tool for Tactile Graphics. This assistive device supports self-paced diagram comprehension for children with visual impairments in low-resource special education settings in India. While tactile diagrams are increasingly available, their instructional value is limited by language barriers, spatial orientation difficulties, and teacher workload. This tool addresses these gaps by enabling students to trigger audio descriptions linked to diagram labels using a simple numeric interface. The lightweight device (Fig. 2) resembles a TV remote, featuring braille-embossed numeric keys, a headphone jack, and minimal setup. Students enter a book and diagram ID, then press the corresponding number on the keypad: a short press plays a label (e.g., “root”), and a long press plays a contextual description (e.g., “the root absorbs water and minerals from the soil”). Designed for classroom environments where teachers manage multiple blind students, the tool reduces reliance on repeated verbal guidance, supports independent learning, and allows students to engage with diagrams in their preferred language and at their own pace.

3.2.2 Digital Literacy Curriculum. The Digital Literacy Curriculum was developed to address the lack of foundational computer skills among blind students in Indian special schools, a gap made especially visible during the COVID-19 pandemic [21]. Typically introduced only in grades 5 or 6, computer education left younger students unprepared for remote learning. This curriculum introduces early screen-reader-based computer interaction using Windows and NVDA, emphasizing auditory and keyboard-first navigation. Developed by a team of blind and sighted educators and technologists, it comprises scaffolded components: Teacher Instruction Kits, one-on-one trainer support, student-facing audio-video content, guided activities, practice exercises, and self-learning tools such as a mini-website and a simulated dialogue box. Designed for both online and offline use, it accommodates varied connectivity and promotes student autonomy even in the absence of family or teacher support.

3.2.3 Content Delivery System for Braille Display. This web-based platform 3 delivers regional-language braille content to Hexis—a child-friendly refreshable 6-dot braille display—by automatically converting uploaded text into Unicode Braille using the LibLouis engine. Developed collaboratively by a nonprofit, a tech startup, and a research institution, the system enables educators to manage and distribute accessible content through a user-friendly interface suited for varying levels of digital literacy. Features include guided upload workflows, searchable libraries, and analytics synced from student devices to track reading habits and progress. Designed to overcome low braille literacy, scarce regional content, and complex file structures, the platform simplifies content transfer, ensuring materials appear automatically on the device. It also supports multilingual audio labels for tactile diagrams, enabling seamless integration with the audio-labeling tool to enhance self-paced learning.

4 Methodology

This study adopts a qualitative and longitudinal approach to examine three accessibility-focused interventions: an audio-labelling tool for tactile graphics (hardware tool), a content delivery system for a braille display (software interface) and a Digital Literacy program (an intervention). These interventions have been in development and use over an extended period, allowing for deep, reflective engagement with both the technologies and the communities they serve. To analyze and extrapolate the socio-technical dimensions of these interventions, we draw on the method of Collective Memory Work (CMW) [18, 62]. A collective-memory work stems from a narrative inquiry orientation that leverages inter-subjective memory as knowledge constructed in collaboration. CMW enables a situated, reflective process through which the researcher—also a participant in and facilitator of these interventions—reconstructs memories, dialogues, and design decisions collaboratively with co-participants and through reflexive writing.

This approach makes visible the affective, embodied, and relational dimensions of accessibility work, allowing us to critically examine how access is negotiated, co-constructed, and sometimes withheld within specific socio-technical contexts. Tapping into the organizational history of designing and implementing programs, a collective-memory approach allowed us to examine and unpack the sociotechnical complexities that shape accessibility and equity in the global South. In our analysis of the interventions using CMW, we take a deductive approach – remaining grounded in the core propositions of A4E. Memories were elucidated over a course of three months.

4.1 Collective Memory Work

Collective Memory Work (CMW), first developed by Frigga Haug and colleagues [33], is a feminist research method that combines autobiographical memory with collective analysis to surface and theorize lived experience. Rooted in social constructionism [17, 17], CMW treats memory not as static data, but as a site where personal narratives intersect

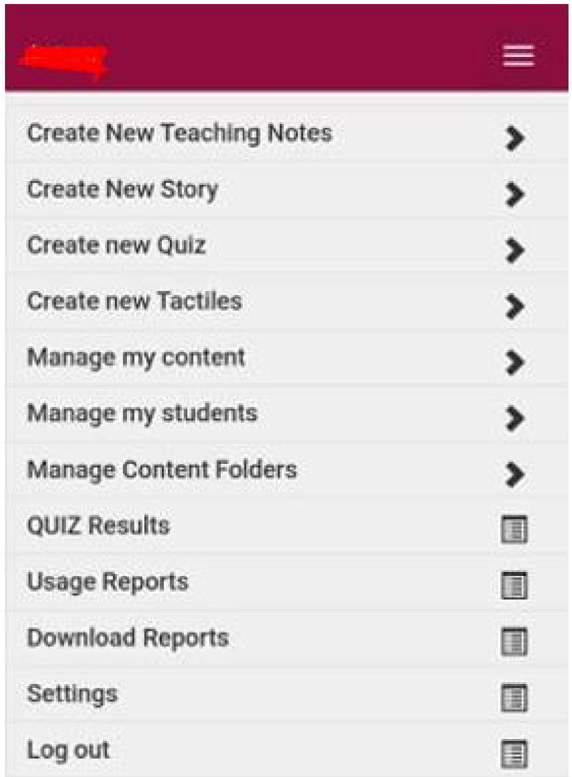

Fig. 3. Snapshot of the Content Management Platform

with broader ideological, institutional, and cultural structures. The method foregrounds intersubjectivity—how shared remembering generates knowledge that is simultaneously personal and collective, affective and analytical. It proceeds in three loosely structured phases: individual memory writing, group-based collective theorization, and extended theorization by researchers or the collective itself. As Farrelly et al. (2017) [25] note, this method is particularly effective in revealing the "texture of the everyday" and in resisting dominant norms through a feminist ethic of care and slowness. We argue that CMW is especially well suited to unpacking large-scale, long-term interventions developed through partnerships between academic institutions and non-profits. First, such interventions often unfold over time and across institutional memory—making retelling and reflection critical for reconstructing their socio-technical trajectories. Second, CMW emphasizes collective understanding, making it a powerful way to take stock of interventions shaped by diverse actors and experiences. Given the subjectivities around collective memories, we now outline our positionality that shapes our analysis of the three interventions.

4.2 Positionality

As a blind researcher and practitioner working at the intersection of disability, education, and technology in the Global South, Author 1A's lived experience deeply shapes her research questions, methods, and interpretations. Her positionality—as someone embedded in the very contexts she studies—offers unique insights into access and equity, while also demanding ongoing reflexivity. Having worked at the nonprofit (2019–2020) and later as a doctoral researcher at the research institute, she has been closely involved in designing and implementing the interventions discussed in this paper, especially the Digital Literacy curriculum which she co-designed. She has also tested and done fieldwork for audio labelling tool, and content delivery platform. This research is informed not only by academic inquiry, but by her continued engagement with the socio-technical and infrastructural challenges of disability in India.

Author 1B identifies as upper-caste, middle-class, non-disabled male. When he initially joined the research team, the three interventions were already being implemented across schools in India. He has been involved in exploring potential of integrating audio labelling tool in various settings and has conducted participant observations at the teacher training session for the same. Through involvement in ongoing interventions, he got access to the collective-memory of the organizations' portfolio of work. His interpretation of the interventions is painted by his interest in examining sociotechnical systems for inclusive design.

The third author is a faculty member at a research institution deeply invested in research on technology, accessibility and inclusion in the global South. In addition to this, he serves as a founder and trustee at a nonprofit organization and an assistive technology startup. He pioneered the three intervention by taking an advisory role, providing strategic direction and designing programmatic interventions.

The fourth author is the co-founder of the nonprofit organization at the center of the interventions discussed in this paper. Her foundational grassroots research in the domain of accessibility and education ultimately resulted in the conceptualization of the three interventions. With deep, sustained involvement in the design and delivery of these interventions, she brings practitioner expertise and institutional knowledge that ground the analysis in lived programmatic realities. Her long-standing engagement with special education ecosystems in India offers critical insights into the structural, pedagogical, and policy-level dimensions of accessibility.

4.3 Operationalizing Collective Memory Work

Collective memory work involves three phases - writing individual memories, collective analysis, and further theorizing [33]. The first phase of Collective Memory Work involves the construction of a shared memory base—typically through written narratives—where participants reflect on specific experiences related to the research focus. In our adaptation of this method for large-scale socio-technical interventions, we began by grounding our memory base in the retrospective accounts of six key designers and implementers who were closely involved in the development and rollout of the three interventions. These participants reflected on their roles, decision-making processes, and the sociotechnical challenges that shaped each intervention's trajectory. To enrich and contextualize these accounts, we supplemented them with a diverse set of materials generated during the interventions: 50 contemporaneous field notes, 37 pilot study reports, and three archival documents detailing the features, implementation strategies, and usage contexts of audio labelling tool, Content delivery platform, and the Digital Literacy program. These records captured different temporal layers of each intervention and allowed us to situate the retrospective memories within a broader institutional and historical narrative. The second phase of Collective Memory Work centers on collectively theorizing the memories constructed in Phase 1. This phase moves beyond description to critically engage with the social, aspects embedded within those memories. In our case, the two first authors met regularly over a two-month period to read through and analyze the retrospective accounts, field notes, pilot reports, and technical documentation collected in Phase 1. These sessions involved iterative annotation, reflection, and discussions aimed at making sense of how the interventions unfolded and how access was imagined and enacted. Through this process, we arrived at a coherent and shared understanding of

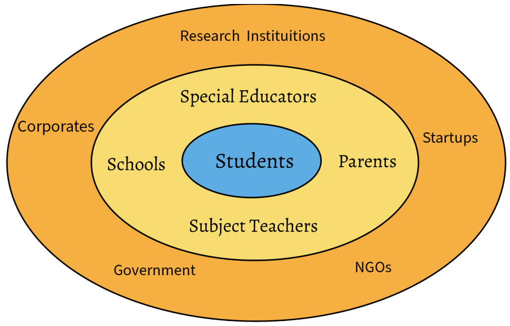

Fig. 4. Education ecosystem for the blind students in India

the three interventions—examining not only what was done, but how and why certain choices were made, and what socio-technical assumptions underpinned them.

In the third phase, we engaged in extended theorizing, moving between our collective understanding of the interventions and relevant literature to situate our reflections within a broader analytical frame. Drawing on the A4E framework, we examined how its three tenets—collaboration, born accessibility, and access intimacy—played out across our interventions in the specific contexts of the Global South. This process involved operationalizing the A4E framework not just as an evaluative lens, but as a means of unpacking what equity in technology-mediated education looks like when shaped by infrastructural constraints, diverse actors, and context-responsive design. As part of this phase, we engaged in discussions with the third and fourth authors, who had been closely involved in the design and implementation of all three interventions, to refine our interpretations. These conversations helped confirm the relevance of our theoretical framing while surfacing further insights that were incorporated into the final analysis.

5 Findings

The findings are structured as follows: First, we examine how access work in the Global South necessitates multi-actor collaboration. The involvement of diverse stakeholders underscores the heterogeneity of educational institutions and opens possibilities to include children with visual impairments throughout the process. We then explore how such collaborations prompt strategic responses to power asymmetries. Co-creation and power redistribution reveal a broader sociotechnical arrangement in resource-constrained settings, where born-accessible interventions often remain out of reach. Finally, we introduce jugaad access to illustrate how access work unfolds through iterative, improvised solutions attuned to the contextual realities of the Global South's educational ecosystem.

5.1 Co-Creation Perspectives from the Global South

Various factors, such as the predominance of special schools over inclusive schools, corporate rather than government funding, and the influence of local languages, have contributed to a diverse set of actors (as shown in Fig. 4) shaping the technology mediated education ecosystem for visually impaired students in the Global South. This, in turn, has necessitated unique approaches to collaboration and co-creation tailored to these contexts. In this section, we examine the different ways in which co-creation unfolds in Global South settings.

One key way in which co-creation manifests in the Global South is through the very process of defining and articulating the problem before developing solutions. The involvement of diverse stakeholders—ranging from educators and students to NGOs, policymakers, and corporate funders—necessitates a collaborative approach that moves beyond problem-solving to problem-framing. Given the heterogeneity of educational contexts, a one-size-fits-all approach is inadequate. Instead, interventions must emerge from continuous engagement with local communities, ensuring that educational technology solutions are contextually relevant.

The development of the audio labelling solution for tactile diagrams, exemplifies the role of co-creation in the Global South. Over the past decade, India has made significant strides in the production of tactile graphics, largely due to research into low-cost solutions. As a result, the availability of tactile graphics has increased. However, a critical challenge remains: most tactile labels are in English, limiting their accessibility in schools where instruction occurs in local languages.

This issue is compounded by several factors. Braille labels must either be small enough to fit within the diagram or placed on a separate page, making them harder to navigate. Additionally, because braille labels are typically in English, they are often not useful in classrooms where students learn in regional languages. The language specificity of braille further limits the reusability of tactile graphics, as materials created in one language cannot easily be adapted for use in another. Beyond these linguistic and spatial constraints, practical challenges in the classroom also influence the need for alternative solutions. Unlike inclusive schools, where a teacher may have only one or two blind students in a class, teachers in special schools often work with six or seven blind students at a time. This means they must individually guide each student using hand-over-hand explanations, a time-consuming process that adds to their workload. The audio labelling tool emerged as a direct response to these challenges, illustrating how problem-definition itself is an iterative and collaborative process. By replacing static braille labels with audio labels, It removed space limitations and allowed for more detailed explanations in whichever regional language was most comfortable for the child. The interactive design of the system further enhanced accessibility—tapping once on a label would provide a basic identification (e.g., "root"), while double-tapping would offer a contextual description (e.g., "the root absorbs water and minerals from the soil"). This feature significantly reduced the burden on teachers, as students no longer required constant individual explanations, creating opportunities for more independent learning. Rather than imposing a pre-existing framework, the development of this tool was shaped by educators, students, and practitioners, ensuring that it met the contextual needs of special schools in India. This case highlights the necessity of designing education technology interventions that are responsive to the lived realities of stakeholders in the Global South.

Another way co-creation can take shape is through building synergies between different Disabled People's Organizations (DPOs) and startups. Rather than working in silos or reinventing the wheel, leveraging existing systems and practices developed by other organizations can create more efficient and scalable solutions. In the case of audio labelling tool, for example, we intentionally built upon the existing tactile diagram practices used by another startup, which commonly uses a method where Braille numbers are affixed to different parts of a tactile diagram, with corresponding labels provided on a separate sheet.

This tool was designed to integrate seamlessly with this system. Instead of creating new diagrams from scratch, we used the numbered labels already embedded in RLF's diagrams to trigger audio labels in different regional languages. This approach brought clear advantages: it significantly reduced the time and resources our team had to spend on producing specialized tactile materials, and it also meant that schools and students could use the same tactile diagrams they already had, without needing to purchase or prepare separate materials for use with our tool. This not only made the solution more sustainable, but also fostered greater collaboration and resource-sharing across the ecosystem.

In the development of the audio labelling solution, blind individuals were primarily involved in the problem-definition phase, ensuring that the solution addressed real-world challenges in tactile education. However, in other initiatives, it has also been beneficial to involve blind people throughout the design process—not just as end users but as designers, testers, teachers, and collaborators. The Digital Literacy Initiative exemplifies this approach, demonstrating how co-creation can extend across multiple stages of development.

In this initiative, blind individuals contributed at every level. The curriculum was designed by an inclusive team, including screen reader users who brought firsthand expertise to the development process. Once created, the curriculum was tested by blind accessibility testers to ensure usability and effectiveness. In the next phase, blind teachers and digital literacy trainers were trained using the curriculum before delivering it to special schools and blind students. This multi-layered involvement ensured that the initiative was not only accessible but also shaped by those who would ultimately use and teach it.

This approach ensured a more nuanced intervention by involving blind individuals at every stage of the process. Their participation led to a curriculum that was not only accessible but also tailored to the specific ways blind students interact with technology. For instance, the curriculum was designed with a deep understanding of screen readers, ensuring that every stage prioritized keyboard-first navigation and incorporated screen reader announcements. Additionally, the curriculum addressed conceptual gaps that often arise in traditional computer education. Recognizing that the visual layout of a desktop is difficult for a blind child to relate to, the curriculum introduced a more tangible analogy—describing the desktop as a space where frequently used icons are kept close at hand, much like organizing real-world objects for easy access. Furthermore, the curriculum included a dedicated module on form controls and dialog boxes, an element rarely emphasized in standard computer courses for sighted students. This was essential because screen readers announce elements like "checkbox," "radio button," and "combobox" as users navigate. Without explicit instruction on these concepts, blind students might struggle to understand what these announcements signify.

By embedding these considerations into the curriculum, the initiative not only made digital literacy accessible but also ensured that blind students could navigate digital environments with confidence. This highlights how co-creation in the Global South goes beyond accessibility compliance to create interventions that are contextually relevant and pedagogically sound.

Yet another design strategy for co-creation in the context of global South is to democratize technology such that it goes beyond the locus of the designers to enable the appropriate actors such as teachers to customize it based on their unique needs. While designing solutions for improving braille literacy for children through the braille display, independent use of the product offering was a key facet of the design process. The following quote captures the deliberations of one of the members of the core design team:

"All the contemporary technology solutions rely on content that is already pushed by the technology team. So, when it comes to teachers using it for their classrooms, they must contact the company and figure out the process. We did not want it to be that way. Any teacher using our product should be able to use it independently and remotely. We are just making the technology but they must be able to contextualize it based on their lesson plans and student interests. So, that was our main motivation to have a dashboard-based interface which would allow the teachers to add content to [content delivery platform] and push it to Hexis...If a class of 10 students have one Hexis device each, the platform should also assist the teachers in monitoring the proficiency of braille reading based on their lesson plans and grade level."

As the transfer of ownership of content management platform shifted from the designers to other actors, it allowed teachers to conduct assessment and measure braille reading proficiency of individual students in the class. Beyond monitoring the braille learning trajectory, decentralizing the process of content management through a actor-centric platform also provided diverse avenues for braille reading. While teachers primarily used this platform to push curriculum content onto the braille display, students also requested for non-academic, recreational content such as stories, news and general knowledge.

Accommodating diverse braille content traditionally required significant time due to reliance on embossers or slate-stylus methods. By decentralizing control through the content management platform, diverse actors could push content directly to the braille display, enabling on-demand braille reading sessions. This shift allowed children with visual impairments to access content as readily as their sighted peers. Compared to conventional approaches involving publishers or manual embossing, the platform significantly reduced delays and increased flexibility in content delivery.

5.2 Power Distribution

In the previous section, we explored the various methods of co-creation that have emerged in the Global South due to the involvement of diverse stakeholders, as well as the specific product features that resulted from these collaborative processes. Building on this, we now turn to how these features themselves play a role in redistributing and diffusing power within the education technology ecosystem. This is particularly crucial in the Global South, where significant disparities exist in the power dynamics among stakeholders—ranging from policymakers and developers to teachers and students. By examining these shifts, we highlight how co-creation not only shapes the design of interventions but also reconfigures the relationships between those who create, implement, and ultimately use them.

For the audio labelling device, it was necessary for the power to be shifted from the designers to the children who ultimately used the product. The central role of students in the design of the tool came to the fore while deliberating about features around language and content. During the ideation of the tool in the state of Karnataka, most children were comfortable in Kannada, their mother tongue, while some were also reasonably adept at speaking and understanding English. All the students learn in either English or their local languages. Given the familiarity with the regional language, even when the medium of instruction was in English, children felt more comfortable in their mother tongue, Kannada. The language preference was practically difficult to accommodate in the case of printed labels as this would require printing multiple copies of the diagram for different languages. Incorporating numeric labels for the diagram interpretation allowed the disassociation of language from labels, making the language of the diagram agnostic. The affordance of multiple language support was also reaffirmed in the ideation phase by the teachers, who found the tool to be time-saving and efficient when compared to other existing pedagogical approaches:

"We have been getting more tactile graphics in school lately, especially from [AT Startup working on low-cost tactile graphics], which has been really helpful. But the problem is, all the labels are in English. Since I teach in Kannada, I have to sit with each child and translate the labels for them as they feel the graphic. It takes a lot of time, and I wish there was an easier way. If we had this audio labeling tool, that you've been telling me about, I could just have the labels in Kannada, and the students could explore the diagrams on their own without waiting for me to explain every detail."

Besides the language preferences, each child had their unique experiences around exposure to tactile diagrams. While some children were aware of tactile diagrams, having seen them in the past, others had no orientation to tactile diagrams. As a result, there was a marked difference in the ways in which children interacted with and obtained information from the device. Consequentially, the features of the device were grounded in the different ways in which children learnt tactile diagrams. Acknowledging students' primary role as users of technology and device functioning allowed for accommodating different amounts of information. For instance, a student could short press a button to listen to just the label corresponding to the diagram (such as root, stem, leaf, etc., while navigating the photosynthesis diagram). Similarly, a student could long press a button to have the functioning of that particular element in the process of photosynthesis explained to them. Students could, therefore, exercise agency by using either mode of interaction (short press or long press) so as to control the amount of information that they wanted to listen to.

Through multiple language support and self exploration with different amount of information, the tool empowered teachers to seamlessly integrate the device into their lesson plans thereby easing their workload. Notably, while the other instructional approaches heavily relied on teachers mediating the process of learning, this tool by virtue of student-driven interactions did not need extensive support from the teachers. While not entirely independent, availability of the tool made the process of learning relatively simpler. With minimal involvement of teachers, the tool addressed concerns around poor teacher-to-student ratio. The individualistic nature of learning was accommodated in the very design of the tool, allowing for self-exploration by the students. By designing student-centric educational technology intervention, the principle of power diffusion allowed to address the lack of resources prevalent in India.

Another significant way in which power redistribution occurs is through the scaffolding of the initiative. In the Digital Literacy Initiative, first designed and implemented during the pandemic, the structured approach to training played a key role in decentralizing power. Instead of directly training students, the curriculum designers first trained trainers from the nonprofit, who then trained special school teachers, who, in turn, trained the students. This cascading model ensured a much wider reach. Had the nonprofit trained students directly, the number of students impacted would have been limited by the organization's capacity. However, by equipping teachers with the necessary skills, the initiative enabled them to continue training countless students beyond the initial program.

Moreover, at the start of the pandemic, many blind teachers in special schools lacked digital literacy skills, making it difficult for them to conduct online classes effectively. As a result, until around November or December 2020, students were left without structured learning, experiencing a significant loss of education from March to November. By prioritizing teacher training, the initiative not only empowered educators to resume teaching their students but also enabled them to participate in other nonprofit interventions, fostering long-term digital inclusion. Similarly, in case of content delivery platform for braille display, the power differential was prominent among the different actors. The intervention was operational with the courtesy of funding received from the multinational companies as a part of their Corporate Social Responsibility (CSR) initiative. On the other hand, the beneficiaries of the interventions were the special educators using the cloud platform in their school settings to use refreshable braille display as a part of their classrooms. Beyond just mere provision of funding, the program design around refreshable braille display and the content delivery platform involved mechanisms to distribute power from the MNC teams to those pushed to the margins. Notably, the corporate employees of the MNC companies were proactively involved in the process of content creation on the platform through the volunteering initiatives. As a part of the CSR initiatives, companies have a mandate for their employees to contribute certain number of hours in a month/year towards community service. This is frequently met through volunteering sessions with NGOs. In case of content delivery platform, employees participated in such volunteering sessions to create content. This resulted in generating a module comprising a corpus of words, their synonyms and antonyms. Besides the vocabulary enriching modules, other types of content included general knowledge and biographical account of popular figures. Such kinds of byte-sized content enabled volunteers to create lot of content in a relatively shorter amount of time. Through such volunteering initiatives, corporate employees contributed to bridge the gap in availability of braille content. Along the same vein, MNCs offered support beyond mere funding to meaningfully engage in the process of addressing educational injustice.

As a part of a volunteering session, the employees of the companies would spend 2-3 hours on a certain workday towards content creation which would then be pushed to the platform. Involving the corporate entities in the process of content creation provided opportunities to leverage power that is disproportionately accrued by technology organizations to materialize it for technology-mediated education for the children with visual impairment.

In the earlier section, we discussed how the content creation process on content delivery platform was democratized. Allowing diverse stakeholders to contribute braille content for children helps diffuse power imbalances within the education ecosystem. Traditionally, braille embossing beyond government-provided textbooks (which are free) comes at a cost—approximately INR 3 per page, depending on the braille press. As a result, much of the additional braille content available in school libraries has been donated by NGOs or corporate funders, who often determine what kind of reading material is made available. However, their choices may not align with the children's braille reading levels or interests. For instance, in some schools, we found entire shelves filled with the "Oxford English Dictionary", "National Geographic Kids", and "101 Moral Stories for Children". These books, while well-intentioned, were often impractical or unengaging. A single print page converts into roughly 2 to 2.5 braille pages, making large volumes like dictionaries almost impossible to navigate. The National Geographic books, stripped of their graphics, became difficult to comprehend, as the text alone often lacked context. Similarly, 101 Moral Stories for Children was not necessarily the most engaging or age-appropriate material for all students.

By introducing a braille display and a platform where teachers, parents, and schools can directly provide content for children, content delivery platform disrupts this traditional power dynamic. Instead of content being dictated by those who have the financial means to donate books, decision-making shifts to those closest to the child—teachers, parents, and schools—who are better positioned to assess reading levels and select relevant and engaging material. This shift ensures that children have access to content that truly supports their learning and interests, rather than being limited to what external donors consider valuable.

The large scale corporate volunteering for content creation is a testament to the severe need for braille content for children with visual impairment in a low-resource setting such as India. This is in stark contrast to educational settings in the global North wherein braille content is widely available with appropriate infrastructures ensuring access. Given the extensive corporate involvement in making basic educational infrastructure speaks volumes about the ways in which the power dynamics in the global South significantly vary. Given the diverse actors defining the design and delivery of educational programs, designing for equitable technology-mediated education therefore necessitates diffusing power through unique approaches.

5.3 Jugaad Access

Both co-creation and power distribution, as described earlier unpack how the three interventions adopt approaches that are in stark contrast to the global North. We now zoom out to examine the macro-conditions under which these interventions perform access work, which in turn necessitates an approach that prioritizes getting things done through quick fixes, i.e. jugaad, over universal solutions.

"Frequently translated as "hack" or "quick fix," the North Indian term jugaad refers to a method of solving problems by "making do" with "what is at hand" [14]. These acts of making do are often driven by necessity, particularly in contexts where access to formal infrastructure, funding, or standardized tools is limited. In the field of accessibility, especially in the Global South, jugaad becomes not just a survival strategy but a powerful site of creativity and resilience. The mixed materialities and ad-hoc sources that constitute these solutions often challenge dominant frameworks of access, innovation, and representation. In this section, we explore how teachers, students, and organizations working with blind and visually impaired learners routinely engage in such acts of improvisation—crafting access in ways that are deeply contextual and driven by constraints.

A jugaad approach to accessibility involves working toward access incrementally—building it piece by piece, rather than waiting for top-down born accessible solutions. In the Indian context, where resource limitations, gaps in teacher training, linguistic diversity, and social stigma around blindness persist [53], the pursuit of born accessible solutions often remains elusive and aspirational. Instead, the reality calls for ground-up solutions that are responsive to sociotechnical constraints. All three interventions discussed in this paper followed a lean, iterative approach—conducting pilots to test feasibility and refine the design before scaling. This method allowed teams to assess real-world viability within the limitations of infrastructure, funding, and institutional support. Unlike in the Global North, where accessibility is often built into policy and practice, access work in the Global South frequently entails crafting ad hoc, context-sensitive interventions that act as building blocks toward broader inclusion. A jugaad approach to accessibility, then, is not about settling for less—but about making meaningful progress with what is available, while always keeping the long-term vision of equity and access in view. This is concretely manifested in case of the three interventions as pilot studies with a few schools eventually crystalized into state government-approved programs across the schools. Notably, memorandum of understanding between the NGO and the state governments is one such mechanism by which jugaad access progresses into an expansive model of engagement resulting in better learning experiences for children with visual impairment. Thus, what began as a testing ground for exploring potential of AT to improve education for children with visual impairment, resulted in a systemic intervention in partnership with the government.

The partnership between an academic institution and a field-based non-profit is illustrative of how jugaad access operates through strategic collaborations in the Global South. While academic institutions bring research expertise and the capacity for knowledge creation and dissemination, it does not have direct access to the field or the everyday realities of the community. Nonprofits, on the other hand, work closely with schools for the blind, teachers, and children, and has a deep understanding of the lived experience of disability, but may not always have the institutional infrastructure to produce and circulate knowledge in academic or policy circles. In this context, jugaad access emerges as a way of bridging these asymmetries—not through large-scale systemic reform, but through iterative, collaborative processes that align complementary strengths. Research institution's academic work is grounded through field insights of nonprofit, while NGO is able to scale its impact and shape public discourse through its association with the university. Rather than waiting for policy overhauls or top-down mandates, this model works within existing constraints, using locally rooted knowledge and relationships to build toward more equitable access, piece by piece.

This logic of jugaad also shaped the design of the interventions themselves, in how we responded to regional contexts and infrastructural constraints to ensure access. In the case of audio labelling tool, for instance, a key challenge was the mismatch between the language used in tactile graphics and the linguistic preferences of students. Most tactile diagrams available in schools were labelled in English, but many students struggled with English and preferred labels in regional languages. Instead of redesigning or recreating an entirely new set of tactile diagrams for every language, we leaned into an existing practice by another organization which used numbered braille markers on diagrams with labels on a separate page. The tool built on this practice by introducing audio labels that corresponded to the numbers, but crucially, allowed teachers to record or upload these labels in the child's native language. This ensured that schools didn't need to procure new diagrams, and students could access information in a way that made sense to them—an example of a resource-efficient, contextually grounded workaround. Importantly, the aim was not to force a premature transition to English, but to prioritize comprehension and comfort by enabling learning in regional languages first.

A similar approach guided the design of Content delivery platform. The problem we encountered here was twofold: there was very little regional language educational content in braille beyond textbooks, and even less that was immediately accessible and responsive to a child's specific learning level or interest. At the same time, the existing braille displays on the market were designed primarily for adults and assumed a certain level of digital literacy. Children in special schools often found it overwhelming to navigate multi-level folder structures, transfer files via USB or Bluetooth, or manage complex content workflows. The jugaad here was in reimagining how content could be delivered to the child: we designed a minimal, child-friendly interface on the braille display and built systems for teachers or parents to easily push content directly to the device, removing the need for the child to handle technical steps themselves. The goal was to lower the entry barrier while still giving the child the benefits of Braille reading in the language of their choice.

The digital literacy intervention perhaps most clearly illustrates jugaad access in action. Conceived during the early months of the COVID-19 pandemic, the intervention had to grapple with an almost complete lack of internet access and physical contact with students. It was not just that students lacked internet connectivity—many of them were at home in rural or remote villages where stable data networks were unavailable. Even imagining internet access as a viable solution was out of the question. A number of students were first-generation learners, and while some had access to their parents' mobile phones, they were often feature phones or phones shared among multiple family members. In many cases, parents themselves were unfamiliar with tasks like joining conference calls or downloading content, which meant even phone-based teaching posed significant barriers. The lack of digital familiarity among both students and their caregivers created a situation where real-time online instruction or elaborate virtual platforms were simply not feasible.

In this context, the digital literacy program had to be designed around the principle of self-contained learning, with minimal dependence on connectivity. The team developed two lightweight, offline tools to bridge this gap. The first was a local website that could run entirely on the child's system without the internet. Each web page doubled as a learning tool, teaching the child to navigate web interfaces using a screen reader—exploring how to move between headings, activate links, or read tables. The second tool was a consolidated interface presenting all common form controls—such as checkboxes, combo boxes, edit fields, and radio buttons—in one place. This allowed students to practice navigating and interacting with these elements using their screen readers, without needing to go online. Both tools were designed for self-paced learning: students could explore the content independently, and teachers were available to support them by clarifying doubts rather than delivering full-fledged lessons. Both tools embodied jugaad access—not just in their technical design, but in how they made room for contextual limitations while enabling meaningful learning pathways.

6 Discussion & Conclusion

Through a reflexive account of a software platform, a hardware solution and a programmatic intervention, in this paper we explicate the nuanced complexities that undergird the education for children with visual impairment in India. We now situate this within the discourse on equity and accessible computing. In our analysis of the three interventions, we revisit Shaheen's framework of Accessibility4Equity [58]. In so doing, we reaffirm the need for diverse disciplinary ideas ranging from HCI and Disability studies to education, coalescing into an enriched understanding of equity in the context of accessible education. Accessibility4Equity framework (a) underpins collaborations between educators and disabled people to foster equitable technology-mediated education, bridging discourse and praxis (b) advocates for born technologically and pedagogically accessible learning environments (c) asserts institutions to develop access intimacy so as to quickly address pressing needs that concern the education of children with visual impairment. These key propositions when coupled with the insights from the global South reveals approaches of performing access work differently. The absence of an established accessible infrastructure invites a rethinking of pedagogical practices, one that accounts for resource constraints. In pursuit of the ultimate goal of systems to evolve and become born accessible, we are also encouraged to leverage quick-fix make-do solutions that are contextualized.

At the outset, we contend that the facets discussed in the previous section do not encompass all the dimensions of equitable technology mediated education. Rather, we bring to the fore the very context-dependent, relational, pluralistic nature of equitable technology-mediated education in low-resource settings of global South such as that in India.

The first proposition of the Accessibility4Equity framework emphasizes the need for collaboration between educators and disabled people in designing technology that supports equitable education. However, in the context of the global South, this framing requires careful unpacking. Neither “educators” nor “disabled people” form homogenous groups. In our interventions, educators include subject teachers, special educators, and teachers in special schools, each with different kinds of access to the child, the curriculum, and the technologies in question. Likewise, disabled people are not merely end-users of technology, nor do they act in isolation. They are often embedded within Disabled People’s Organizations (DPOs), NGOs, and even corporate and academic spaces—as designers, educators, policy-makers, students, and advocates. Recognizing this complexity is crucial, because it surfaces the ways in which disabled people participate across the ecosystem, bringing lived expertise to the table in roles that go far beyond use. Yet, not all of these actors wield equal influence. Power differentials—rooted in class, geography, disability status, institutional affiliation, and access to networks—shape who gets to make decisions, whose knowledge is prioritized, and how co-creation unfolds. In our work, co-creation emerges not as a unified process but as a distributed, multi-actor engagement that must constantly negotiate these differences.

This is precisely why we examined how co-creation manifests differently in the Global South. Given the presence of varied actors—each operating within uneven distributions of power, knowledge, and access—co-creation becomes a plural, situated, and evolving process. In our work, this took different forms: involving blind professionals in the problem definition phase in audio labelling tool, embedding blind teachers and facilitators in every aspect of the multi-layered scaffolding that structured the digital literacy program, and democratizing content creation through content delivery platform, where diverse actors could generate localized, context-aware educational materials. These varied pathways reflect how designing with and for disabled people in the Global South often requires flexible, grounded approaches to co-creation that are as diverse as the communities themselves.

The second tenet of the Accessibility4Equity framework advocates for learning environments that are born technologically and pedagogically accessible. However, in low-resource settings such as India, the goal of born accessibility is often aspirational rather than immediately achievable. Constraints related to infrastructure, training, linguistic diversity, and digital access mean that educational technologies and pedagogical models rarely emerge fully accessible from the outset. In such contexts, we instead rely on incremental, context-specific adaptations—what we termed as jugaad access. These interventions function as provisional, quick-fix solutions that address pressing challenges in a case-by-case, problem-by-problem manner. Yet their value lies not only in immediacy; over time, these jugaad interventions collectively act as building blocks that gradually push the system toward greater inclusivity. Rather than viewing jugaad as antithetical to systemic change, we position it as a method of piecing together accessibility from the ground up—where each small solution contributes to a larger, evolving infrastructure of access [53]. While these fixes may not always lead to universal accessibility in the conventional sense, they cumulatively generate a more accessible state—one that is deeply grounded in the sociotechnical realities of the Global South.

While the school ecosystem in the global North has robust institutions and capacities to swiftly respond to access needs, this is in stark contrast to the sociotechnical context of the global South. Notably, what constitutes as an educational institute itself involves heterogenous ensemble of institutions comprising nonprofits, academic research institutions, and technology companies. We therefore witness diverse actors bringing in expertise to form a nexus of institutions. In this resulting configuration, the non-government organization (NGO) takes the centre-stage and becomes a conduit for transformative access work. While academic institution contribute towards shared knowledge, technology company contributes through appropriate assistive technologies. These resources are then pooled together by the NGO to craft a jugaad accessible educational environment.

Alongside our conceptual effort to extend the Accessibility4Equity (A4E) framework to Global South contexts, this paper also introduces a methodological contribution to HCI through the use of Collective Memory Work (CMW). To the best of our knowledge, this paper marks the first introduction of Collective Memory Work (CMW) as a methodological approach in Human-Computer Interaction (HCI). While HCI has increasingly embraced reflexive and qualitative methods, CMW brings a distinctive contribution by framing research through shared memory and collective meaning-making. It enables a form of "memory-based inquiry" that allows researchers to engage with the social and affective histories of technologies—not only focusing on what systems do, but how they come to be, and how they are shaped through lived experience over time. This is particularly valuable in studying technology-mediated educational interventions, where the evolution of a system is deeply entangled with the institutional, interpersonal, and contextual decisions that shaped it. In long-term interventions spanning partnerships between NGOs and educational institutions—as in our case—CMW offers a structured way to reconstruct how an intervention unfolded over time, even when the original team members, roles, or intentions have shifted. It provides researchers with tools to assemble fragmented institutional memory into a coherent narrative and to surface the socio-technical values embedded in the design and implementation of accessibility-oriented technologies

Technology invariably disrupts existing socio-technical power relations—reconfiguring how people, institutions, and systems interact. However, such disruption is not inherently positive; without critical attention [43], it can reinforce or even exacerbate existing inequities, particularly for disabled learners in the Global South. By foregrounding jugaad as a strategy for equity, we offer a way to steer disruption toward more just and inclusive ends—where solutions are co-created, adaptive, and contextually grounded. This perspective enables us to juxtapose dominant narratives of technological innovation—often rooted in formal, Global North-driven paradigms—with more situated and improvisational forms of access-making. In doing so, we emphasize the importance of representation and co-creation, positioning jugaad not only as a practical response to constraint, but as a critical mode of designing otherwise.

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Received 20 February 2007; revised 12 March 2009; accepted 5 June 2009