Learning, Marginalization, and Improving the Quality of Education in Low-income Countries

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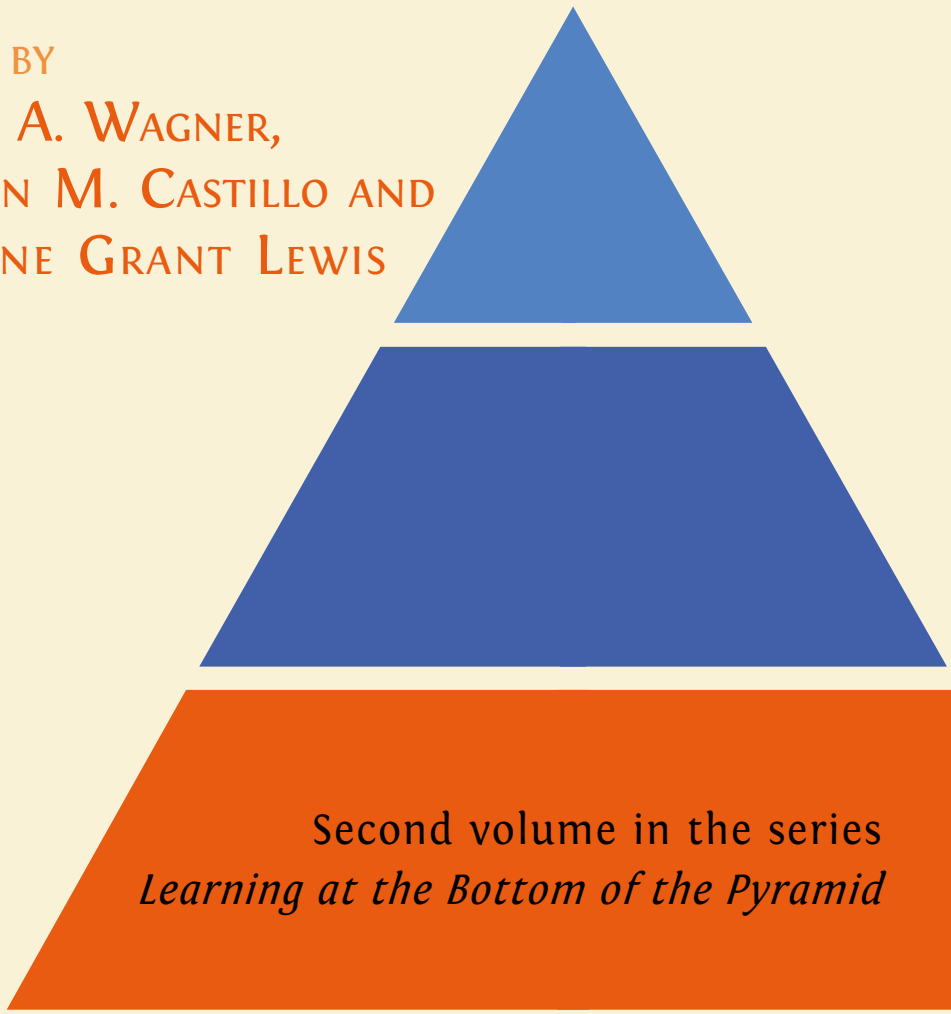

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11. India

The Role of Civil Society Organizations and Scalable Technology Solutions for Marginalized Communities

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Introduction

In this chapter, we look at innovations led by civil society organizations (CSOs) that have improved learning outcomes of children at the bottom of the pyramid (BOP) in India. In doing so we hope to explore questions regarding (i) the role of CSOs in developing innovative and effective solutions; (ii) the value of indigenous knowledge and innovations; and (iii) methodologies of creating positive impact by taking innovations to scale, especially by leveraging technology for education. We also realize that there are several other questions that we may not be ready to ask and answer on this issue; for instance, could we build a staircase to ascend to the top and flatten out the pyramid in due course (Prahalad & Hart, 2002)? Can private players, including non-government organizations (NGOs), serve a public cause in poor societies by treating the BOP not as a constituency but as a group who deserves to be shown how to climb up (Prahalad, 2009)?

Civil society space in India

South Asia has had a rich history of non-state actor involvement in elementary education. While educational institutions were attached to

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temples, mosques, and monasteries in medieval India, and residential colleges of learning in advanced subjects were set up quite early in its history, the picture changed dramatically after 1854, when the British introduced the first formal Colonial Education Policy. This policy allowed some non-state actors and private schools to develop institutions in the region (Day Ashley et al., 2014). While public schooling initiatives were focused on increasing access, improving quality, reducing inequalities, and reducing costs (Patrinos, Barrera-Osorio, & Guáqueta, 2009), some public private partnerships were attempting to standardize what was being taught and optimize government-backed support.

Jhingran (2015) outlines the evolution of public education in India, and argues that, during the post-independence period, CSOs—and particularly NGOs—increased their participation and collaboration with the central and state governments through the DPEP and SSA programs in education. He observes that large NGOs such as the Pratham Education Foundation (since 1994) and Azim Premji Foundation (since 2001) have developed close collaborations with the state and central governments. In addition, more such organizations of different sizes and capabilities have joined in helping out with education. The notable among them include Make A Difference (or "MAD", from 2006), Teach for India (since 2009), The Akshaya Patra Foundation (since 2000), Akanksha Foundation (since 1991), Child Rights & You (since 1979), Bhumi (since 2006), Deepalaya (since 1979), and Bachpan Bachao Andolan (working since 1980, and supported by KSFC). Together they are able to impact government policy and programs around curriculum, pedagogy, textbooks, and teacher training. Finally, Jhingran observes that "some of them have actually started to set up state teams housed in the SCERTs or state offices. Many of them now have leverage because they are also providing man- or woman-power to the state SSA societies".

The CSOs are not only partners to public institutions, they also help hold those institutions to account (WEF, 2013). They serve as advocates for positive change, supply subject matter experts, support capacity building, incubate innovations and solutions, represent marginalized communities, encourage citizen participation, promote fundamental rights and values, and set standards that shape the market and activities. The stakeholders of any generalized education system must provide support that is social, economic, and environmental (Salvioni

& Cassano, 2015). Civil society partnerships provide support and resources (both financial and non-financial) to the education system, in addition to integrating policy with grassroot needs and accountability.

Civil society, in addition to government and private business, is a key change lever for the growth and improvement of education, especially for those at the bottom of the pyramid and those at the primary level. Bjorn Lomborg's work (2014) at the Copenhagen Consensus Center has shown that investing in early learning has phenomenal benefits. Investing in the education of children under five years of age not only increases the likelihood of healthier life, but also reduces future costs of special and remedial education, as well as achievement gaps and overall social costs. Research suggests that "every dollar invested in high-quality early childhood education produces a 7 to 10 percent per annum return on investment" (Heckman et al., 2010).

Driven by this zeal, the government of India spent INR 23,500 crores (FY 2017–2018) on Sarva Shiksha Abhiyan (Accountability Initiative, 2018) to provide free and compulsory education for all children between the ages of 6 and 14 under the Right to Education Act. Mired by multiple inefficiencies and leakages, this investment has not resulted in equivalent benefits. Pritchett and Aiyar (2014) show the difference between the accounting cost and economic cost of publicly funded education, implying that "the excess cost of achieving the existing private learning levels at public sector costs is Rs. 232,000 crores (2.78% of GDP, or nearly US$50 billion)". In other words, public education is expensive in addition to being inefficient.

If economists were to calculate the Herfindahl-Hirschman Index[1] for schooling in India, they would find a trend showing decreasing government monopoly in education after 2000. Furthermore, while the government is the largest funder of education, the private and civil society sectors are the leading innovators and providers of novel solutions. The ability of CSOs and NGOs to provide low-cost innovations has encouraged the government to view CSOs as partners, rather than competitors. With few exceptions, NGOs typically are more community-oriented, and therefore have a better understanding of local-speak and local sociocultural landscapes—what some call an indigenous

1 As developed by Orris C. Herfindahl and the economist Albert O. Hirschman; see https://en.wikipedia.org/wiki/Herfindahl–Hirschman_Index.

approach. The NGOs' ground-level connections also serve as crucial marketing channels that enable effective scaling of innovations with greater community buy-in.

Indigenous knowledge and sustainable development

Indigenous or traditional knowledge refers to the "long-standing information, wisdom, traditions and practices of certain indigenous peoples or local communities" (Kothari, 2007). Typically, sectors related to agriculture, forestry, fisheries, and traditional housing make extensive use of indigenous knowledge that is passed down from generation to generation (Posey, 1999). More recently, the adoption of traditional practices has enhanced the sustainability of many production chains across secondary and tertiary sectors such as textiles, pharmaceuticals, and medicine.

Ellen and Harris (1996) characterize indigenous knowledge as having 10 salient features (see Fig. 1.). Much of this knowledge was devalued and even ridiculed by nineteenth-century social scientists, who often held an antipathy towards indigenous knowledge systems (Warren, 1989). As a result, traditional and indigenous knowledge, which is considered the social capital of the poor, was grossly overlooked by the colonial education system (Senanayake, 2006). Furthermore, cross-cultural studies have shown that transmission and maintenance of indigenous knowledge depends on economic, social, cultural, and ecological factors. Conservation of this knowledge can only be achieved by local preservation and growth strategies (Paniagua-Zambrana et al., 2016). Thus, the question before us is, how do we blend local and global knowledge and technologies to offer the best practices of both worlds to children at the bottom of the pyramid? (see Figure 1)

The indigene and learning technology

Comparative analyses have demonstrated that globalization, global competition, and a need for 21st-century skills have resulted in the homogenization of some aspects of child development and education curricula across nations (Sparapani et al., 2014). Learning through play, problem-solving, learning by doing, and experiential pedagogies are

Fig. 1. Characteristics of indigenous knowledge. Source: the authors.

some examples of common, yet experimental, approaches being used throughout the world. Research shows that large gains in children's learning outcomes can be achieved when instruction is aligned with learners' learning levels (Banerjee et al., 2016). Gamified teaching-learning aids and learning through play are adaptive techniques that organically align with a capability-based teaching methodology.

Pratham Education Foundation (Pratham), one of India's largest education NGOs, observed substantial gains in foundational mathematics outcomes of 10,000 slum children who participated in a longitudinal randomized experiment, where they played mathematics computer games targeting math learning (Banerji & Chavan, 2016). Similarly, the Bridges to the Future Initiative, a technology-based intervention, implemented in primary schools in West Godavari and secondary schools in Ranga Reddy districts "had a modest (marginally significant) impact on the reading skills of both young children and

youth/young adults who had no prior experience with computers" (Wagner, Daswani, & Karnati, 2010); later work in South Africa, using a similar approach, had much more robust learning outcomes (see Castillo et al., this volume). Evidence from remedial reading and math interventions has also shown that children are able to sustainably learn foundational skills if the lessons are mapped to their capacity.

The positive impact of educational games on the development of children is well-known. Yet existing or even innovative solutions that are "ported" from the Global North often fail to assist children in rural and developing contexts in their learning journeys. Kam et al. (2009) analyzed 28 traditional games across villages in India that children engage with on a regular basis and compared them to the characteristic features of digital games to understand the difference in uptake. Contextually constructed games create "virtual environments with rich backgrounds where players participate actively", where these games continuously "challenge players to develop new skills". As argued by Fine (2012), our world is constructed of "tiny publics" that allow us to share affiliations with others. These small groups are spaces where social actors operate within the bounds of society—a phenomenon that is observed in games involving groups. Shared "social experiences" ultimately develop shared contexts for growth and social communication (Kam et al., 2009).

Arvind Gupta, a renowned scientist and inventor, has demonstrated how science and math can be taught in low-income environments by using locally sourced materials. This is where children are encouraged to use their own imagination and problem-solving capacities to find solutions to puzzles, which often leads to higher learning gains. He states that the best way for children to learn is by doing (Krithika, 2019). Although the tradition of learning from indigenous technologies is on the decline, from a design perspective they "show remarkable examples of the creative and thoughtful use of materials" (Khanna, 2018). The key strengths of indigenous technologies that can be leveraged to improve learning outcomes are: (1) dynamism; (2) simplicity of materials; (3) affiliation with cultural ethos; and (4) alignment with scientific principles and technology. In the remaining sections we showcase instances of learning technologies developed and propagated by NGOs that have substantially moved the needle in the Indian context. In each

example the problem, solution, and benefits are presented. We are aware that technology alone will not solve all the problems with education (Toyama, 2015), but that it is a crucial lever in maximizing improvement (Garton, 2017).

PraDigi Open Learning: An example of a scalable indigenous tech-based solution

The story of low foundational learning levels is not new (see Crouch & Slade, this volume). In India, it goes back to 2005, when Pratham Education Foundation, now one of India's largest educational NGOs, launched the Annual Status of Education Report (ASER). Volunteers were trained and marshalled to collect evidence about children's reading and numeracy skills across India's rural districts. What was discovered was critical for educational planning, though distressing. This Indian innovation found acceptance in other countries that faced similar challenges. Citizen-Led Assessments (CLAs), which are characterized by their robust design yet simple-to-use tools and processes, were taken up by eight organizations that eventually came to be known as the People's Action for Learning (PAL) Network. Today, the PAL Network has 15 members who have cumulatively assessed more than 7.5 million children by engaging about 690,000 volunteers over the past 15 years

PAL Network conducted the International Common Assessment of Numeracy (ICAN, 2020) between October 2019 and February 2020, where it assessed the foundational math competencies of more than 26,000 children from approximately 15,000 households in 779 rural communities (villages) across 13 countries. A cluster of 60 villages was selected from one subnational region (district) per country.

As a cross-national assessment, ICAN has the potential to provide a Global-South-based platform for comparative and benchmarking purposes. In addition to its policy-level impacts at the international and sub/national levels, ICAN also has the necessary characteristics to significantly influence regional educational responses towards foundational learning. As pointed out by Schwantner and Walker (2020), ICAN promises to: (1) provide a single source citizen-led assessment that can be adapted to various local contexts and languages; (2) broaden our understanding of numeracy and increase the scope

of early grade assessments through a collaborative effort; and (3) provide insights about foundational learning necessary for monitoring educational outcomes of children at all levels. With the support of the Global Partnership for Education's Knowledge and Innovation Exchange (KIX) grant, PAL Network and its partners are in the process of a common-scale adaptation of the ICAN tool that assesses children's pre-numeracy and early numeracy skills. Evidence from assessments inform in-class practices and intervention designs to improve children's foundational learning. In what follows, we will discuss an innovative, digitally-supported intervention by Pratham that not only uses data on children's learning outcomes, but also their daily interaction with the digital system to enhance engagement and uptake.

Building on its work across rural India, Pratham's PraDigi Open Learning program is a community-based, digitally enabled open-learning intervention that spans multiple cognitive and non-cognitive skills (Singh, Sharma, & Verma, 2017). The program has been evolving since its inception, experimenting with content, delivery mechanisms, learning structures, and other programmatic aspects. PraDigi Open Learning's iterative design has created an open learning space for children and youth to prepare for school, work, and life. The program has achieved this through three pillars:

- Social structure—systems and structures to encourage the community to actively participate in children's learning.
- Digital infrastructure—mobile devices and technology placed in the hands of children, used for guided learning and fun activities.
- Learning content—a wide array of contextualized content created in the form of videos and games.

PraDigi Open Learning is a non-formal (out-of-school) learning experiment that dynamically tries to improve how children learn in rural India. It draws on the belief that children are naturally curious and interested in learning. In the absence of traditional teaching, the program's hybrid model of blending the three support pillars (social, digital, and content) has enabled responsive learning experiments. The programs help children build their skills and learn, even outside a school setting. In the absence of a prescribed curriculum (a conscious choice),

children are encouraged to choose what they want to learn, set their learning goals, and participate in group activities where they manage their own learning, including assessments to measure their progress on topics. Youth volunteers who support the groups in the learning activities are called coaches.

PraDigi Open Learning has undergone multiple stages of evolution. Beginning as a proof of concept called "m-learning program" in early 2015, the program was scaled up from 50 villages in the Pisangan block of Rajasthan to 400 villages across Uttar Pradesh, Rajasthan, and Maharashtra in 2015. About 26,000 children between Grades 5 to 8 were enrolled. However, the number of children who benefited from the program was higher, as quite often friends and siblings of participants also participated. PraDigi Open Learning utilized the close-knit "*mohulla"* structure of villages to involve and encourage the participation of children's guardians, and every child in the village was welcome to be part of the groups that were engaging with Pratham's digital content. The program leveraged the natural group-based activities of children, as well as the potential of digital content and devices.

After a controlled trial in 2017 to study the PraDigi Open Learning model in Rajasthan's Dausa district, the program expanded and evolved further, with a renewed focus on self-organized learning and delivery of project-based learning content. Children were encouraged to select courses themselves, set their own targets, and manage their own learning experiences within the program. A majority of the experiences continued to be rooted in group-based learning activities, but personal practice was also built in through mock assessments and a final assessment managed by the program facilitators. The content for the open learning initiative is broadly clustered in three domains: preparation for school, preparation for work, and preparation for life.

The PraDigi approach seeks to blend technology with indigenous social support systems, and had a unique impact on children's learning habits. In the period of 2017–2019, the digital learning tools reached more that 300,000 learners through 22,000 tablets and organized more than 19,800 learning groups. With minimal intervention, learners engaged with the app for 12–14 days a month on average for 55–60 minutes per day. A total of 70+ million minutes were clocked on the app over an 18-month period. A controlled learning experiment with 139 treatment

villages and 99 control group villages with no intervention found that children with access to the PraDigi Open Learning showed the maximum improvements in science, English, and Hindi assessments. Participants in the program outperformed children in the control group by 12 percentage points in school curricular subjects (World Economic Forum, 2020).

The curiosity of children, communities, and staff has enabled multiple innovations. One such experiment was Pratham's Code Club Pilot.[2] This experiment was launched in 2019, across 40 villages in Aurangabad (Maharashtra) and Sitapur (Uttar Pradesh), with 50 coaches mentored 244 code clubs, reaching 1109 learners. Children in these low-resourced communities were given the opportunity to learn and utilize computer programing to execute a live project. Approximately 40 percent of the groups that started their project managed to complete it, with the support of their peers and coaches.

Conclusion

The PraDigi Open Learning program is a unique program that blends technology, children's curiosity, and traditional social structures to engage communities in children's learning. In this program, children manage their own learning outside a school environment and were found to have outperformed their counterparts who only engaged with the traditional school-based learning model. Its architect, Madhav Chavan, summed up this child-friendly learning and education by stating that education needs to "move away from the age-grade system…. Instead we need an age-stage system that allows children to meet learning goals in both the social and academic sphere when they are ready, transitioning to each stage at their own pace".

Educational technology is not a magic wand that can solve all the ills ailing education, especially inequity and non-inclusion. However, technology can be leveraged to improve access to education and buttress delivery of quality learning modules. Furthermore, recent evaluations of tech-based products such as instructional aids, individual-use products, and personalized adaptive products have reported that it is important for solutions to be tailored to children's capability levels and deliver

2 Pratham Education Foundation's internal document, "Code Club Pilot".

child-friendly content in vernacular languages (Sampson et al., 2019). One hopes that, with continued partnerships between public, private, and non-profit agencies, technology can be prudently used to improve learning in India.

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