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# Digital Aspirations and Ground Realities: Understanding the Disconnect Through an SDG-Aligned Study of Rural Computer Literacy Centres

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# Digital Aspirations and Ground Realities: Understanding the Disconnect Through an SDG-Aligned Study of Rural Computer Literacy Centres

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**ABSTRACT**

With the goal of becoming a developed nation by 2047 (NITI Aayog, 2024 & World Bank Group, 2026), India envisions rural areas equipped with digital infrastructure, improved digital inclusion, and a digitally literate rural population. These visions closely align with the United Nations Sustainable Development Goals (SDGs), such as SDG 4 for Quality Education, SDG 8 for decent work and economic growth, and SDG 9 focusing on Industry, Innovation and Infrastructure. Despite such visions of digital inclusion, there remains a challenge in implementing digital awareness in rural areas, either because budget allocation does not allow adequate infrastructure to be established or because limited digital awareness prevents rural people from adapting to digital technologies effectively. This chapter will focus on addressing awareness of Computer Skills among students in rural India, with invaluable support from Sundesh Foundation, an NGO serving a rural village, in providing access to its Digital Literacy Centers. The study will involve collecting primary data through various methods, including a printed questionnaire to understand students' views on digital accessibility directly and an online survey to understand the NGO's views on its program delivery and how it feels about the community it works with. It will also examine the efficiency and implementation of various government digital literacy schemes in rural areas. In doing so, the study will examine the challenges posed by limited digital infrastructure in village schools. Therefore, the study aims to identify the challenges hindering rural individuals' access to digital knowledge.

**Keywords:** digital literacy, digital divide, rural India, sustainable business practice, sustainable development goals

## 1. INTRODUCTION

India aims to be a developed nation by 2047 through digital technologies that encourage inclusivity and equity for all (NITI Aayog, 2024; World Bank Group, 2026). The Digital India project has three pillars that support it: i) digital infrastructure, ii) digital delivery, and iii) digitally empowered society and livelihoods (Mohapatra et al., 2025). India has made significant progress in expanding digital connectivity, with internet access rising from 14% in 2014 to 55% in 2025 (Statista, 2025, as cited in Mohapatra et al., 2025). However, this does not guarantee individuals will have the skills, resources, and opportunities to utilize digital technologies.

Digital literacy refers to the skills needed to safely and purposefully use digital devices, the internet, and online services. SDG 4 (Target 4.4) focuses on developing skills for youth and adults to help them find decent work, become entrepreneurs, and build careers. SDG 8 focuses on decent work, innovation, and creating jobs (Isaguirre & Ching, 2025). SDG 9 (Target 9.c) aims to make the internet more affordable for least developed countries (Aziz et al., 2025). There are three aspects to the digital divide: access, skills, and outcomes (Arora & Sapre, 2025). A capability approach is used to look at the abilities individuals have through technology (Calzolai et al., 2026).

Following the Digital India program (2015), the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) was launched in 2017 to train at least one person per rural household aged 14-60 (Chauhan et al., 2025). Free content is available through SWAYAM, DIKSHA and the National Digital Library of India. Bharat Net provides broadband to gram panchayats (Chauhan et al., 2025). The Companies Act 2013 made Corporate Social Responsibility (CSR) mandatory for eligible companies (Gahlot & Verma, 2026; Gupta, 2025). Local NGOs help overcome the gaps created by the corporate and state sectors.

Although there has been a comprehensive policy document in place, there is often a gap between policy and practice within and between states. Most of this information comes from national/multi-state data sources (Arora & Sapre, 2025; Oxfam India, 2022) and from users' perceptions of national schemes (Mohapatra et al., 2025). In this review, very little research examines small centers run by NGOs and seeks the views of learners and staff. These centers may be the first point of contact for rural students with computers. This chapter will examine the role that local centers play in driving India's digital literacy initiatives.

Sundesh Foundation is an NGO established in 1993 as a partner to implement CSR initiatives for Dabur India Limited. It is a sustainable development society and works with rural areas in Ghaziabad, Uttar Pradesh. They have Digital Literacy Centers with the NIIT Foundation, including the two centers in this chapter: Hasanpur and Bambawar (Hapur district). These centers provide affordable basic computer courses to rural youth. This chapter uses data from a questionnaire completed by 32 students, interviews with students and a trainer, and an online questionnaire completed by nine Sundesh staff. Participants were selected through purposive and convenience sampling techniques, so findings should be indicative rather than representative.

This chapter outlines how students can access computers and the internet, the skills they develop, including awareness of AI tools, their connection to government schemes, and the career advice they receive. We argue that in India there is a gap between the digital aspirations and the reality. This is not due to a lack of schemes or computers, but rather

because there needs to be a good connection, career advice, equity for girls and boys, and connection to public schemes. This chapter relates to SDG 4 (Quality Education), 8 (Decent Work and Economic Growth) and 9 (Industry, Innovation, Infrastructure). It also relates to SDG 5 (Gender Equality) as there is a gender gap in confidence.

This chapter explores the following research questions:

1. How far does rural students access to digital devices and the internet, at home and at school, translate into regular opportunities to use a computer?
2. What digital skills do NGO-run centers teach rural learners, how closely do these match what learners want, and what limits the program's benefit?
3. How do NGO staff view the center's linkage with government digital literacy schemes and what sustainability risks does reliance in a single private (CSR) funder poses

This chapter contributes to the literature by examining grassroots-level digital inclusion in India. It provides qualitative evidence from two centers about students' experiences. It provides insight into how a local community-based NGO can work alongside government initiatives. It also highlights the risks of relying on a single private funding source from the staff perspective. Finally, this chapter provides practical recommendations for policymakers, CSR planners and educators to move beyond just auditing digital literacy initiatives and make a real impact in the next decade to meet India's 2047 vision.

## 2. LITERATURE REVIEW

The digital divide is no longer understood as a gap in connectivity alone. It is a multidimensional problem shaped by institutional, financial, and technological barriers that vary across countries. In India, these barriers are largely socioeconomic and cultural, with a significant difference between urban and rural areas. Corporate companies and non-governmental organizations contribute to the socioeconomic development of rural communities. Under the Companies Act's CSR requirement, eligible companies allocate part of their profits to social programs that support long-term sustainability. However, Sustainable practices require more than spending money; they also need actionable frameworks in which the actual impact on society is visible, and income groups develop. However, the real challenge in both developing and developed countries is measuring the impact communities experience.

### 2.1 Digital divide as structural barrier to emerging economies

In developing countries, the digital divide is better understood as a structural problem in which the technological gap is not alone but also draws our attention to technological justice, digital inequality, and the capabilities approach (Calzolai et al., 2026). Calzolai et al. (2026) also argue that digital access in society alone does not create real working opportunities. Beyond internet access, technology benefits everyone in the community only under specific conditions, creating a need to re-examine its social and distributional dimensions (Calzolai et al., 2026). Reports indicate that only 31% of the rural population uses the internet, compared with 67% in the urban population (Oxfam India 2022). It also finds that computer access is at

2.7% among the poorest 20% of households (Oxfam India 2022). Among the richest Indian households, it is 27.6%, showing that household wealth strongly shapes computer access. However, it is not the only factor, as diverse factors such as gender, caste, and the cost of digital devices also impact the use of computers in two different societies (Oxfam India, 2022). According to the NSSO data, Asrani (2020) shows that societies' adoption of digital technology in their lifestyles is driven by education, income, and household demographics, and that individuals' capability to use the technology varies by age and gender. Digital inequality therefore arises when certain conditions are not met, leaving urban and rural communities with unequal access to technology. In a study of 18 states in India by Arora and Sapre (2025), which presents skills index data, urban–rural gaps are evident: states with large low-income groups, such as Uttar Pradesh, Bihar, and Madhya Pradesh, rank low in infrastructure, and the digital skills divide is closely associated with them. Because Ghaziabad lies in the capital Region, it may differ from the state-level pattern, so these state-level findings are used here only as background. Internationally, in reports of the case studies by Lorenz et al. (2015), similar patterns of differentiation in countries such as South Africa, Nepal, India, Costa Rica, and Venezuela are characterized by scarce equipment, poverty-related pressures, and device affordability, which separate them from developed countries. Purnamawati et al. (2023) reported that about 40% of Indonesian villages remained untouched by digital technology in 2017, and Chauhan et al. (2025), in a preprint review, identified infrastructure, gender norms, and affordability as recurring structural barriers in rural India. Therefore, these studies suggest that digital connectivity is not solely determined by technology but also by social factors such as gender, caste, income, and location.

**2.2 Comparison of developed and developing countries contexts**

Early work focused on digital access, but now it centers on real concerns about the skills and capabilities needed to use it, with infrastructure and affordability constraints in low-resource areas (Arora & Sapre, 2025). In developed countries, inequality persists due to uneven digital capabilities (Calzolai et al., 2026). Many Countries have widely available internet, but uneven digital skills, so a solution to this digital divide cannot be transferred directly from one country, because the gaps in infrastructure and skills differ (Arora & Sapre, 2025). Kufeoglu (2022) found internet use to be 83% in Economic Cooperation and Development Organization member countries, compared with 17% in least developed countries. Abdel Aziz et al. (2025) find that most SDG 9 research on infrastructure development and sustainable industrialization is conducted in developed countries and originates there, leaving low- and middle-income developing countries understudied. Network coverage and use are different things: although 81% of the world is covered by LTE (Kufeoglu,2022). Lorenz et al. (2025) found that rural schools across six developing countries have mobile devices with internet access but lack computers, trained teachers, and supportive governance, which limits their ability to develop digital skills. India's mandatory approach to corporate social responsibility contrasts with voluntary approaches internationally in Brazil, South Africa, and Indonesia, but Gupta (2025) found common weaknesses, such as limited funding, weak impact measurement, and limited compliance with SDG outcomes. Abdel Aziz et al. (2025) argue that good institutions and effective

government policies influence whether digital transformation can contribute to a country's development. This positions the present study of rural literacy centers as an examination of whether connectivity alone can deliver digital inclusion.

### 2.3 From access to meaningful use: skills and capabilities

The digital divide has now shifted from physical access to the skills, usage, and outcomes it provides. Further, researchers now also focus on measuring the real impact these areas have on society, differentiating the specific skills they learn, how they use technology, and the benefits they receive from it. Arora & Sapre (2025) described this change through the first, second, and third levels of the digital divide. Calzolai et al. (2026) argue that digital inequality is increasing because of differences in how people use technology, their digital skills, and their control over the internet. Equal opportunity, therefore, cannot be inferred from technology use alone, because use does not ensure equal benefits. Arora and Sapra (2025), studying 18 states, found that rural-urban differences in digital skills are greater than differences in digital infrastructure. Fewer than 10% of people in rural areas were able to use basic spreadsheets or programming. Infrastructure and digital skills are strongly related, but some states showed different patterns, with some suggesting that infrastructure is important but not sufficient. Kumar and Kumara (2018) found that 92.67% of rural students who used computers mainly depended on school facilities, and only 22.34% used them at home. Rural students who used computers mainly played games (mean 2.98), while urban students used them more for projects and assignments. In common, where rural schools lack digital infrastructure, students may have to rely on external paid digital services to learn digital skills. Researchers also found that several factors help translate access to technology into actual digital capability. Education and literacy are closely associated with smaller gaps (Arora & Sapra, 2025). Lorenz et al. (2015) found that teacher training supported by feedback can help maintain the use of digital skills in classrooms, while training provided only once tends to lose its effects over time. From a capabilities perspective, (Calzolai et)

### 2.4 Public policy and digital inclusion schemes

(Chauhan et al. 2025) mentions schemes such as BharatNet, PMDISHA, SWAYAM, and DIKSHA. However, they report internet access in only 29% of rural areas, compared with 66% in urban areas. (Kumar and Kumara, 2018) Similarly, they found that only 20.66% of rural students used computers, compared with 69.70% of urban peers, due to power outages and limited digital skills. (Mohapatra et al., 2025) shows that policy design matters psychologically, where goal internalization means people understand the purpose of digital inclusion, and people who did not view the program's actual benefits tend to have lower confidence. Therefore, digital inclusion is not only about providing technology but also about helping people understand, trust, and experience the benefits of digital programs designed for them.

However, the studies reviewed above identify these schemes without reporting evidence of their reach among rural households or their outcomes for learners. Abdel Aziz et al. (2025) argue that digital transformation can support SDG 9 when it is underpinned by e-governance and active involvement from diverse stakeholders. The private sector also plays a vital role in supporting government efforts. Gupta (2025) reports that CSR funding is concentrated in

states such as Maharashtra, Karnataka, and Gujarat, while aspirational districts receive only 4.5% of the funding. Purnamawati et al. (2023) found that CSR strengthens the relationship between digitalization and both village economic development and local development. (Jauhari 2005) suggests that corporate initiatives, such as those by ITC and Barefoot, are more successful when they are designed to the specific needs and development levels of the rural communities they serve. Long-term digital inclusion also requires strong partnerships, as Chauhan et al. highlight the importance of cooperation among the Government, NGOs, and technology providers, as in initiatives like Internet Saarthi. Gupta (2025) also suggests CSR partnerships and public-private partnerships, although evidence on long-term impacts remains limited.

**2.5 Private sector roles: CSR and Ngo linkage with SDGs**

The concept of corporate social responsibility is a viable way for private companies to contribute to the Sustainable Development Goals (SDGs), rather than a charitable act. Gahlot and Verma (2026) explain how CSR has evolved from a charitable to an impact-based approach. CSR highlights areas related to education, healthcare, skill development, gender equality, and water and energy development. Private companies use their CSR funds in these areas, in collaboration with NGOs and government institutions, to achieve greater impact and results. Gupta (2025) reports that the 2% mandatory CSR under Section 135 of the Companies Act, 2013, has supported education and healthcare initiatives aligned with the SDGs. However, the distribution of CSR funds remains unequal, with only 4.5% reaching aspirational districts. Venkatesh and Sykes (2013) highlight the role of CSR in funding digital inclusion initiatives and report higher income growth in the village that benefited from a company-supported digital kiosk program. Purnamawati et al. (2023) find that CSR strengthens the positive effects of digitalization on village economic development in Bali. The Parul University Conference volume suggests that companies' CSR can improve stakeholder relationships, business reputation, and operational efficiency for small and medium enterprises (Patel and Ojha). NGOs support these efforts through technical and field knowledge and advocacy. However, some common challenges arise, including short-term projects with a focus on spending rather than impact or results, weak impact assessment, limited technical skills, and difficulties in measuring the direct contribution of CSR to the SDGs(Gahlot & Verma, 2026; Gupta, 2025). Lastly, CSR effectiveness depends not only on the amount of money spent on CSR but also on strong partnerships with NGOs and other government schemes or institutions, a fairer distribution of resources, and proper impact assessment of long-term outcomes.

**2.6 Multistakeholder partnerships and sustainability of privately funded interventions**

Multistakeholder collaboration is an important approach to ensuring the long-term sustainability of privately funded development interventions. Gahlot and Verma (2026) argue that the Government alone cannot achieve development goals and further recommend public-private partnerships, CSR partnerships, and independent impact assessment to improve facilities and reach. They also propose an identify-align-invest-implement-measure-scale framework to guide project implementation. Gupta (2025) similarly recommends public-private partnerships and corporate MSME knowledge platforms. He further explains that

government incentives have increased MSMEs' willingness to expand CSR activities, while coordination gaps continue to limit the effectiveness of CSR across India, Brazil, and Indonesia. Purnawati et al. (2023) emphasize the importance of local government supervision, business networks, and training. Venkatesh and Sykes (2013) show that corporate-supported initiatives were successful where the conditions and social networks were present. Parul University conference volume further highlights and identifies funding constraints, bureaucratic barriers, and power imbalances as key problems. In the end, privately funded interventions are more sustainable when partnerships are well governed, locally rooted, and supported by appropriate incentives. However, evidence remains limited, as the research is short, single-site, not observation-based, and is conceptually analyzed.

## 3. RESEARCH GAP

The literature review and many other studies show that India's digital divide is quite large, especially when differentiated between rural and urban areas. Oxfam India (2022), Chauhan et al. (2025), and Kumar and Kumara (2018) find that rural people and students have less access to the internet and computers than urban people for diverse reasons. Arora & Sapre (2025) explain that gaps in learning digital skills can be larger than the infrastructure gap. Most of the studies reviewed here use broad national or state-level data to conclude about the digital inclusion gap. However, they do not present much real community evidence or rural area data they have collected, which limits their understanding of how a rural student actually learns to use a computer and what stops them from doing so. Many researchers have listed government schemes such as PMDISHA, BHARATNET, SWAYAM, and DIKSHA in their studies but rarely examined whether rural people even know about these schemes or benefit from them. Mohapatra et al. (2025) studied the national platforms used in one state but did not compare how these schemes address real problems faced by rural people, such as a lack of computers, power cuts, and trained mentors.

Gupta (2025) shows that private companies' CSR funding is mostly directed toward education and healthcare, but it is concentrated in a few states. It does not reach the least-developed states identified by the Government. However, the studies reviewed here do not report how much CSR funding specifically goes to digital literacy, and the evaluation is mostly based on funds spent rather than results achieved. Purnamawati et al. (2023) find that CSR strengthens the impact of digitalization on rural economic development at scale, but it lacks sufficient sample size and an outcome focus on education. Parul University's volume notes that many conference chapters conceptualize the NGO's role but rarely provide beneficiary data to support the evidence or theory presented. NGOs are believed to be a supporting hand between the

Government and private companies, bridging the reach gap in rural communities. However, the studies reviewed offer little ground-level evidence of how these local NGOs work in practice or what challenges they face. Chauhan et al. (2025) and Abdel Aziz et al. (2025) suggest that strong partnerships are needed among the Government, companies, NGOs, and technology providers. However, there are few observed cases of such partnerships. Many of the studies reviewed are conceptual or single-site. Although some are longitudinal field studies, little is known about how these programs perform and continue over time as their funding sources change. The studies reviewed give limited attention to learners' own

perspectives, with emerging skills largely unaddressed. Existing studies measure the lack of computers and training outcomes, but they rarely ask students what they expect from the Government and NGOs, or which skills they want to learn next. A further gap in the literature review is awareness of artificial intelligence, online learning platforms, and employment-linked digital skills, which receive little attention in rural Indian literature. Gender, caste, and income, as structural barriers, can affect rural people's digital opportunities, but studies rarely show how they shape their actual computer skills. Studies from developed and developing countries also do not guarantee that having internet access means students have the skills to use it.

Therefore, we need to understand what other support local NGOs can provide beyond access to technology. Research treats policy, CSR, NGO action, and private partnerships as separate bonds. Abdel Aziz et al. (2025) propose that digital transformation supports SDG 9 only when digital development works with proper commitment from all stakeholders, which are Government, private companies, and technology providers, all together. However, studies are generally theoretical, with no real data samples. We need to view these stakeholders' functions as a whole, such as how the NGO works, how the NGO receives funding, and how government programs are connected to rural needs examined by NGOs, but no studies combine these strands at one site. This chapter addresses these gaps by studying the digital literacy centers run by the Sundesh Foundation in rural Uttar Pradesh. We closely observed and experienced what students know about computers, AI, and online learning, the infrastructure provided by the NGO's support, and the factors that limit their access to skills and technology. It also brings together the diverse views of the NGO's staff and mentors with those of the student learners in those centers. In this way, the chapter shows and links its findings to SDG 4, 8, and 9, and examines the efforts of government and private companies, as well as the risks of CSR funding.

## RESEARCH OBJECTIVES

The chapter is guided by five objectives that communicate its aim and scope. These objectives help in understanding digital literacy in rural India through the case of the Computer Literacy Centers run by the Sundesh Foundation.

1. To examine the digital accessibility of rural students by assessing the availability of mobile phones, computers, and the internet at home, and of computers at school.
2. To assess the digital skills that are taught in centers, skills that the students aspire to learn, and what they expect from the NGO and the Government.
3. To identify the factors that limit students' access to computers at school and the factors that limit the benefits gained from the NGO's program.
4. To explore NGO staff's perceptions of awareness of government digital literacy schemes and the risks associated with relying mainly on private CSR funding.
5. To draw implications for policymakers, CSR partners, NGOs, schools, educators .

## 5. METHODOLOGY

### 5.1 Research Design

This chapter follows a cross-sectional descriptive survey design with a primarily quantitative approach. To achieve the research objectives, we collected data from two groups: community members and NGO staff. This helped the study gain useful insights from both the program's target population and those who made the program available to them.

### 5.2 Participants and Sampling

Two groups participated in this chapter. The first group consisted of community members who attended the centers and were the target population of the program initiated by Sundesh Foundation. They are also often referred to in the chapter as students who attend the centers. We surveyed a total of 32 community members from both centers: 19 from the Bambawar center and 13 from the Hasanpur center, Uttar Pradesh. The second group was the NGO staff. We had 9 employees present to respond to the Google Form.

The study used purposive sampling to select Sundesh Foundation and the two centers because of their relevance to digital education in rural communities. This sampling method has also been used by previous studies that examined digital literacy and digital inclusion among relevant communities and participants (Isaguirre & Ching, 2025; Juniper, 2026). For the survey, convenience sampling was used because collecting data from the entire target population is time-consuming and expensive (Etikan et al., 2016), so we approached community members and staff of the foundation who were available on the day of our survey.

### 5.3 Research Instruments

The questionnaire designed for the community members was a printed form. It consisted of 20 multiple-choice questions with a tick box to make it easy to answer them. The questionnaire asked about demographics and profile, digital accessibility in the village, and what they expect from the Government and the NGO. The options were designed based on the expected responses from community members, while some questions also included an open-ended option to invite more detailed answers. A printed form was created for them to ensure that respondents with limited digital access were not excluded.

For the staff survey, a 22-question Google Form was used. The survey was essentially about their views on community issues, government support, partnerships and funding, and expectations from other institutions. The form consisted of multiple-choice questions, 1- to 5-star ratings, and short-answer questions.

Both the questionnaire and Google Form were prepared in English. They were translated into Hindi so that respondents could understand the questions more easily in the language they were comfortable

with. The use of translated questions to improve respondents' understanding has also been used in previous digital literacy research (Isaguirre & Ching, 2025).

### 5.4 Data Collection

The questionnaires were administered directly to community members during visits to the Computer Literacy Centers. Each of them was provided with a printed copy of the form and given sufficient time to fill it out. We ensured easy understanding of the questions by reading them aloud to them and helping individual respondents. Each form was collected and maintained after successful completion of the survey.

For the Google Form, we created a QR code for easy scanning and access. They were also guided whenever they faced difficulty understanding any question.

### 5.5 Data Analysis

The software used for data analysis was Microsoft Excel, which helped group data on a single sheet and analyze responses from both parties. The NGO provided us with a student database in Excel containing information on their demographics, residence, qualifications, and future goals—the raw dataset required cleaning before it could be used for data analysis. Cleaning steps included the removal of confidential data such as Name, date of birth, Father/Guardian name, and address, and each student was assigned an ID code to identify each one. After cleaning, the responses in the survey form were entered into Excel in the proper column heading for each question. This way, the responses were systematically organized so they could be reviewed and analyzed to summarize the data in proper graphs and charts. The responses entered into Excel were carefully matched with original responses in the survey form to maintain data accuracy. Originally, the data for single-answer questions were not entered in a standardized format (e.g., "yes", "Yes"), so separate columns were created to standardize the data and enable effective analysis in Excel. For multiple-select questions, each option was coded as a yes/no variable (1 if the respondent selected it and 0 if they did not), based on searching each answer for the option keywords. We then matched the coded output to the actual response to assess data accuracy.

For the staff survey, the Google Forms responses were downloaded as a Microsoft Excel file. The multiple-select questions were coded in the same way as in the student survey Excel file. Counts and percentages were calculated using Excel functions such as COUNTIF and SUM. Percentages for the student survey are calculated from 32 respondents, and for the staff survey, from 9 respondents. This applies to multiple-select questions as well, so the sum of percentages can exceed 100%. The results were presented as bar charts.

### 5.6 Ethical Consideration

Data collection is a sensitive process because it involves sharing information that respondents do not normally share. To respect the privacy of the respondents, we gave careful attention to ethical considerations. Before participating, we informed the respondents about the purpose of this chapter (Pandey et al., 2026). We also told them about the type of information we would collect, how their responses would be used, and where it would be used. The respondents were informed that the information collected would be used only for academic purposes and would be published in a book chapter. They were assured that, other than the stated uses of their data, we have no intention of using or sharing their data with any third party. After these declarations, the respondents' consent was obtained, and data collection began.

Participation was completely voluntary, and respondents were free to decline. Respondents' names were not used in the study and were kept confidential to protect their privacy.

### 5.7 Limitations of the Study

This chapter has some limitations which should be considered before making any interpretation. First, the sample size of the study is small (32 community members and 9 NGO staff), and they were selected through purposive and convenience sampling, meaning that the centers were chosen on purpose and the respondents were chosen conveniently. Therefore, the findings of this chapter should not be generalized for other rural communities of India. The situation regarding digitalization and institutional support may differ across places. Second, the study follows a cross-sectional descriptive survey design, which means that the respondents were studied at a particular point in time rather than over a period, so the study cannot establish any change that occurred among the respondents.

## 6. RESULTS

This section covers the key findings from data collection for the two groups in this chapter, using the methods defined in the Methodology section. We begin with the student questionnaire, which covers key topics such as digital accessibility, the hindrances students face in obtaining digital access at school, the skills taught by NGO programs, and the skills community members want beyond those provided by such programs. We then report on the findings from the staff survey, the challenges the community they work with faces, awareness of government digital literacy schemes, and the risks of relying mainly on private/CSR funding. The student percentages in every chart are out of 32 respondents, and the staff percentage is out of 9 respondents. In some of the charts, the percentages may add up to more than 100% because users can select more than 1 option.

### Student Survey

**Figure 1. (a) Digital Accessibility among students; (b) Where a computer was used before CLC**

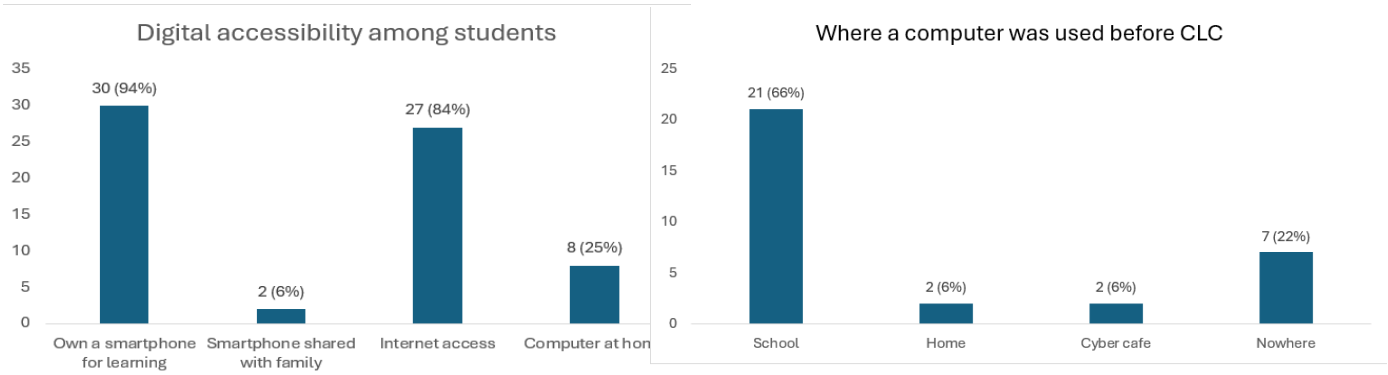



Fig. 1a suggests that all the students had a smartphone at home, and among them, 30 (94%) had their own smartphone for learning, while the remaining 2 (6%) shared it with their family. The figure also suggests that twenty-seven (84%) of them also had internet access at

home. However, the availability of computers was much lower than that of smartphones, with only 8 (25%) having one at home.
This is consistent with the result from Fig. 1b, which shows where they used a computer before joining the center. Twenty-one students used school computers, while only two used them at home and another two at a cyber café. Seven students had never used a computer before joining the center, according to the data. Although 8 (25%) students had computers at home, only 2 (6%) used them before joining the center. For most students, the source of access to a computer was school.
(66%) before joining the center. Since very few students have computers at home, the center is likely the place where they can use one.
***Note:*** *Fig. 1a combined three independent yes/no questions, so the percentages add up to more than 100%. Each bar shows the number of "yes" answers from 32 respondents.*

**Fig. 2 (a) Digital Access at School (b) Hindrances to digital access at school**

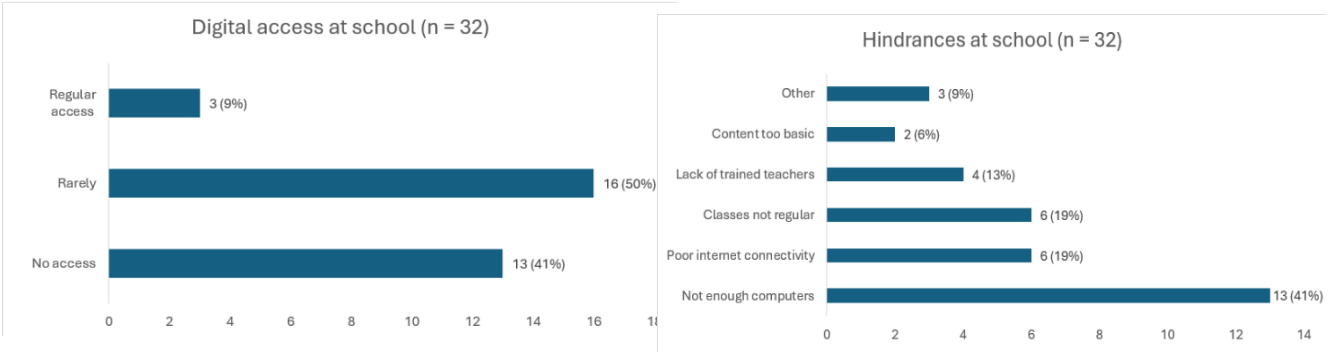



Fig. 2a shows digital accessibility at school and how often they are allowed to use it. As the chart reveals, of thirty-two students, nineteen (59%) have access to computers at school, while the remaining thirteen (41%) have no access to computers at school. While a majority of students have access to computers, a significant number still do not have access to computers at school. Of the total sample, only three (9%) have regular access, while sixteen (50%) report that they rarely have access to computers.
Fig. 2b outlines a few reasons for the lack of proper digital accessibility in schools. According to this chart, not having enough computers in school is the most common hindrance to digital accessibility, with 13 students (41%) selecting it. Six students (19%) feel it is due to poor internet connectivity, and another six students (19%) feel it is due to irregular classes held by the school. Four students (13%) pointed to a lack of trained teachers at school, and two (6%) thought that the content is too basic to be taught at school. The remaining three (9%) had other opinions on this matter.
*""**Note:** Fig. 2b was based on a multiple-select question, so percentages add up to more than 100%.*

**Fig. 3 (a) Skills taught at the center (b) Skills students want to learn**

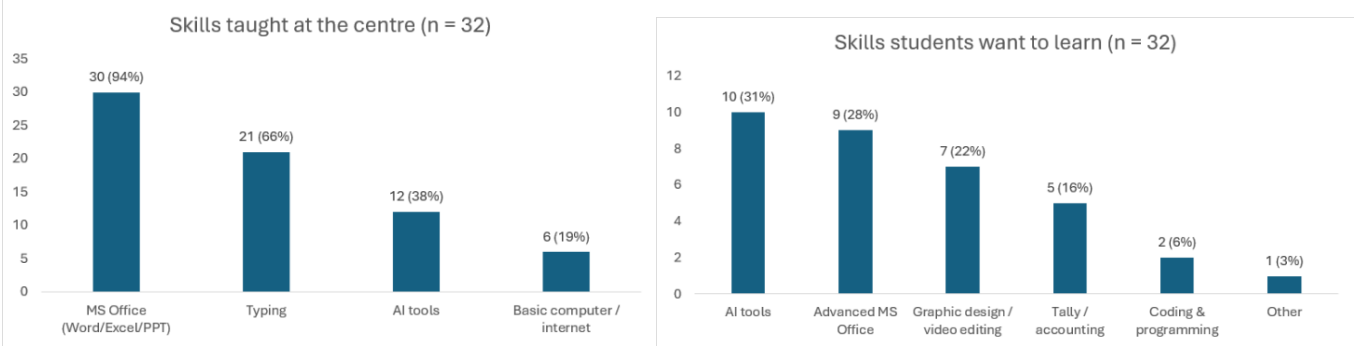



Fig. 3a displays the skills that the centers taught these students as part of the NGO's program. Among all skills, MS Office (Word/Excel/PPT) appears to be the most commonly acquired by students from the course, with 30 respondents (94%) selecting it. This is followed by typing skills, selected by 21 respondents (66%). Twelve respondents (38%) said they learned about AI tools from the course. Six (19%) respondents reported learning the basics of using computers and the internet. According to students' responses, the centers provided basic computer knowledge to most of them and AI tools to some.

Fig. 3b shows, in addition to the basic skills provided by the centers, what else students want to acquire. The skills they most wanted were AI tools, Advanced MS Office, and Graphic design/Video editing, selected by 10 (31%), 9 (28%), and 7 (22%), respectively. Tally/Accounting 5 (16%), Coding & programming 2 (6%), and other 1 (3%) were chosen by only a few students.

*""**Note:** Both the charts of Fig. 3 were based on multiple-select questions; therefore, the addition of percentages will be more than 100%.*

**Fig. 4 (a) Expectation from NGO (b) Expectation from Government**

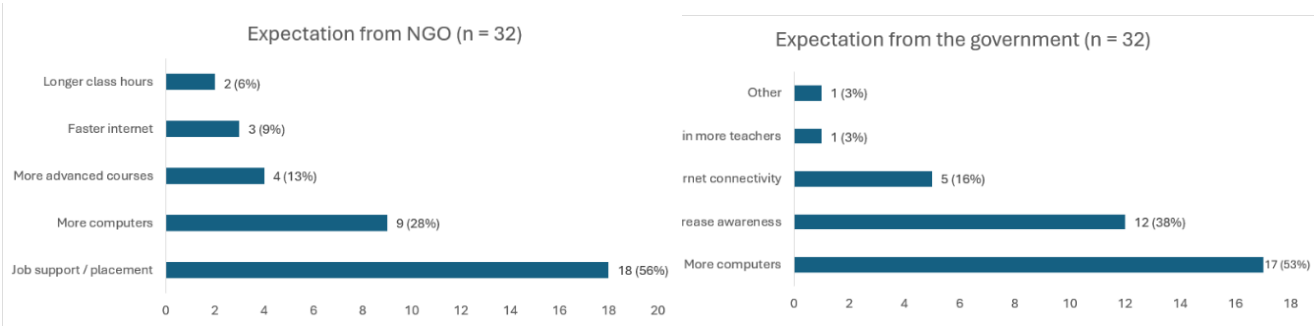



Fig. 4 shows students' expectations of the NGO and the Government regarding increased digitalization in rural areas.

Fig. 4a emphasizes that 18 respondents (56%), more than half of the sample, expect the NGO to provide job support and placement opportunities. This suggests that students seek employment and placement support from the NGO. Besides that, nine (28%) responded that they expect more computers in the centers. More advanced courses 4 (13%), faster internet 3 (9%), and longer class hours 2 (6%) are some of the other expectations from the NGO.

In Fig. 4b, we see that two expectations are shared by both the NGO and the Government.

More computers were the most common expectation from the Government (17, 53%) and from the NGO (9, 28%). The second most common expectation was to increase awareness of government schemes among the target population (12, 38%). Better internet connectivity was also expected from both, by five respondents (16%) from the Government and three (9%) from the NGO. One of them (3%) expected the Government to train more teachers, while another (3%) had other expectations of the Government in this regard.
*""**Note:** Both the charts of Fig. 4 were based on multiple-select questions, so the percentages add up to more than 100%.*

**Staff Survey**

**Fig. 5 Hindrances to getting full benefit of the program**

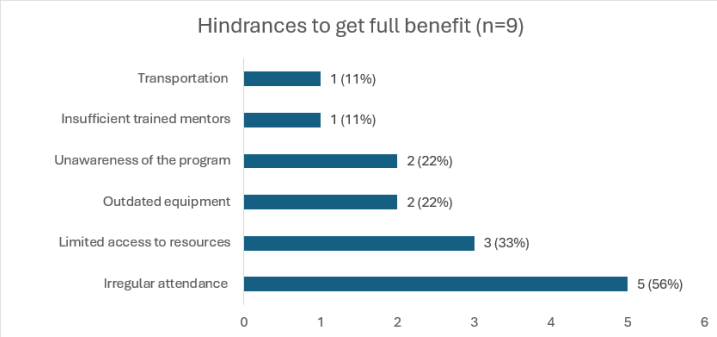



Fig. 5 shows the hindrances that prevent the community from fully benefiting from its computer courses, as observed by Sundesh's Staff. The most common hindrance to getting full benefit from the NGO's program is irregular attendance at the centers (5, 56%). As responded to in the Google Form, it was due to family and personal work obligations. Limited access to resources such as devices and internet, as stated in the Google Form (3, 33%), is also a hindrance, as perceived by the Staff. Outdated equipment in centers (2, 22%) is also a hindrance, which may limit access to modern technology. Community members who are unaware of the program are another hindrance to benefiting from it (2, 22%). Insufficiently trained mentors at centers (1, 11%) and transportation to the center (1, 11%) are also hindrances to benefiting from the program.
*""**Note:** Fig. 5 was based on a multiple-select question, so the percentages add up to more than 100%.*

**Fig. 6: Awareness of government digital literacy schemes**

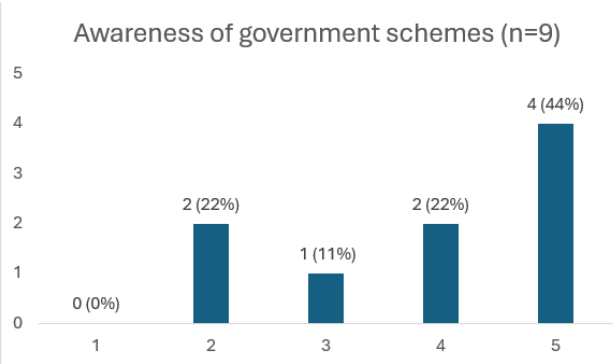


Fig. 6 shows how aware community members and Staff are of the government digital literacy schemes, as rated by Staff: 1 indicates no awareness, and 5 indicates full awareness. Four Staff (44%) rated 5 out of 5, indicating they believed they, along with the community they work with, had full awareness of the government schemes for digital literacy. However, that does not mean everyone was fully aware of them. As the graph presents, two (22%) of them selected 4 out of 5, meaning they were almost fully aware; one (11%) selected 3 out of 5, meaning they were moderately aware; and finally, two (22%) selected 2 out of 5, meaning they were slightly aware of the government schemes regarding digital literacy. One thing to note is that no one selected 1 out of 5, which means no one reported being completely unaware of the government schemes, as rated by staff. This gives an average awareness rating of 3.9 out of 5 and a median of 4 out of 5.

**Fig. 7 Risks of relying on Private/CSR Funding**

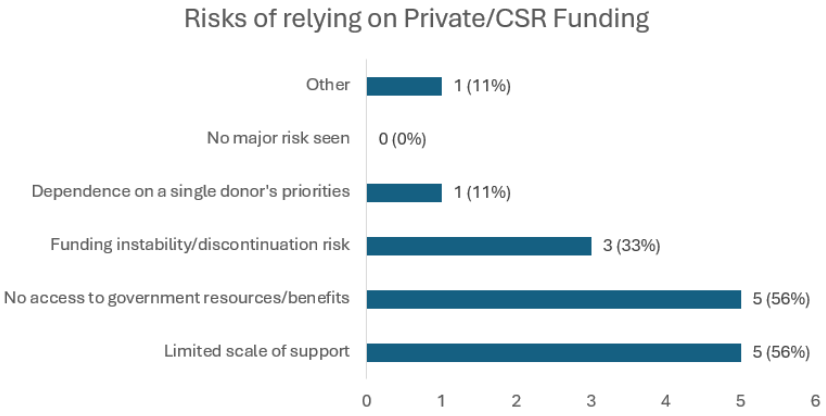



Fig. 7 highlights the common risks associated with relying mainly on private/CSR funding to run the NGO's program. As reported by the NGO staff, limited support and lack of access to government resources or benefits were the most common risks, each selected by 5 staff (56%). Funding instability/discontinuation was selected by three (33%), and dependence on a single donor's priorities was selected by one (11%) staff member. As Fig. 7 shows, every staff member selected at least one risk of relying mainly on private or CSR funding.
**Note:** Fig. 7 was based on a multiple-select question, so the percentages add up to more than 100%. Percentages are out of 9 staff.

## 7. DISCUSSION

Building on the findings of the results section regarding digital accessibility, hindrances to digital accessibility, expectations from the NGO and the Government, etc., this section aims to discuss what the results mean. The findings of the research will be used to interpret the state of digital accessibility, the hindrances to achieving it and to getting the full benefit of the NGO's program, the risks of relying mainly on Private/CSR Funding, and to compare them with national data and earlier research. Instead of restating the results, this section aims to derive meaning from them.

*""**Note:** Percentages for student findings are out of 32 and for staff out of 9.*

### 7.1 Digital Access at Home

All students in the sample had access to smartphones, and most had one for their own learning purposes (94%), while only a few shared it with their family (6%). Most also had internet access at home (84%); however, only a quarter (25%) had access to computers at home (Fig. 1a). These findings are broadly consistent with national data. ASER 2023 found that 89% of rural youth aged 14-18 had a smartphone at home, but only 9% had a computer (ASER Center, 2024). About 72% of our students were in the same age range, and the rest were younger or older. The National Statistics Office's Comprehensive Modular Survey: Telecom, conducted between January and March 2025, found that 83.3% of rural households had internet access within their household premises (MoSPI, 2025). These figures suggest that smartphones and internet access are common in most rural households. However, having only a smartphone may not build practical digital skills. A national survey in Chile found that people who used only a mobile phone had lower digital skills than those who also used a computer (Correa et al., 2020). This suggests that students without a computer at home have fewer chances to build skills.

### 7.2 Computer Access at School

Among the students we surveyed, computer access at schools appeared limited. About two-thirds (66%) of the students had used a school computer before joining the center (Fig. 1b). However, when we asked about access to computers at school, only 9% reported regular access, 50% used them only rarely, and 41% had no access (Fig. 2a). These findings suggest that having a computer at school does not necessarily mean regular access to it. This is also consistent with national rural data. The national data were collected by ASER, a survey in which surveyors visit a government school in each sampled village and record what they see that day. In the 2024 survey, children were found to be using computers in only 11.1% of the schools visited, and 16.2% of schools had computers available but were not being used that day. On the other hand, the remaining 72.6% of the schools had no computers available for children to use (ASER Center, 2025). However, the findings of ASER should not be directly compared with the students surveyed in this chapter because ASER focused on village government schools, while the schools of these sample students
may or may not be a government school, but it still makes an important point: a computer in a school does not always mean students can use it.

There are reasons for such hindrances in digital access at school, and some were also reported by students in Fig. 2b, among which insufficient computers (41%), poor internet connectivity (19%), and irregular classes (19%) were common. A survey of 1,224 teachers from 319 rural schools in Jammu Division revealed that inadequate ICT infrastructure and poor internet connectivity were among the most reported barriers. The lack of trained teachers was also reported, but less often (Kour & Mirza, 2026). Since students use the same ICT and internet, these barriers may also limit their access.

### 7.3 Hindrances to getting benefit of the program

As discussed above, students faced barriers to accessing school computers for several reasons. Therefore, Computer Literacy Centers of Sundesh Foundation may provide students with another place to use and practice on computers and build computer skills, instead of relying only on school computers. However, there are still barriers to fully benefiting from such programs. Staff reported that irregular attendance because of family/work responsibilities (56%), limited access to resources (33%), outdated equipment (22%), and unawareness of the program (22%), among others, are some of the reasons that may limit students from getting full benefit of the program (Fig. 5). Similar barriers have been reported by earlier research. A systematic review of 86 studies on digital literacy training programs for marginalized populations identified barriers at the administrative, training, and learner levels. At the training level, these included scarce and outdated computers, poor internet connections, and inflexible class timings; at the administrative level, inadequately organized awareness and communication activities. At the learner level, lack of time and family support were reported (Choudhary & Bansal, 2022). The review did not directly study attendance, but these learner-level barriers are related and may be relevant here. This indicates that barriers to benefiting from digital programs may not be specific to Sundesh Foundation, as similar barriers have been reported in many other programs. Some of these barriers are common across programs, while others can be specific to a particular program. There are still barriers to getting benefit from the program, which means that running a center alone may not ensure that students get full benefit, because equipment, awareness, and attendance also matter.

### 7.4 Risks of relying on Private/CSR Funding

The CSR funding by Dabur India Limited to support the Computer Literacy Center program of Sundesh Foundation can be seen as an ethical way of utilizing corporate resources for a social cause, and it helps improve digital access among the youth of Hasanpur and Bambawar. However, there are concerns about relying mainly on private CSR funding, which were also reported by the NGO staff. From the Staff's point of view, relying mainly on Dabur's CSR Funding would mean limited scale of support (56%), no access to government resources or benefits (56%), funding instability/discontinuation (33%), and dependence on a single donor's priorities (11%). Some of these risks are associated with how CSR funding is structured. Under Section 135 of the Companies Act, 2013, an eligible company must spend at least 2% of its average net profit over the preceding three financial years on CSR. Then the CSR committee recommends a CSR policy listing the activities, which the board approves (Companies Act, 2013, s. 135). This means that the minimum CSR spending depends on the company's profitability and its board's decisions, and is not set by the program's needs. Resource dependence theory suggests that organizations that depend heavily on a funder for critical resources are exposed to that funder's changing demands (AbouAssi & Tschirhart, 2018). The program may therefore benefit from
additional funding partners. One option worth exploring is to link to government schemes to leverage their resources and benefits. This may reduce the risk of relying on a single donor and could also provide access to diverse government resources.

## 8. IMPLICATIONS

The findings of this chapter identified several barriers students face regarding digital access and skills. An analysis of these findings will now be discussed in relation to the main stakeholders, including policymakers, CSR partners and NGOs, schools and educators, universities, volunteers, and researchers. They will be tied into the SDGs and the limitations of this chapter. The findings from this chapter may also apply to other similar initiatives, given their similarities to the Sundesh Foundation's centers.

### 8.1 Policymakers

The research has highlighted a gap between policy and practice. Many initiatives aim to increase digital literacy, internet access, and learning opportunities; however, there appears to be inconsistency in awareness of these. Whilst only 3.9/5 (Fig. 6) staff felt stStaffere aware of government digital literacy initiatives, 38% of students wanted increased awareness from the Government (Fig. 4b). However, 22% of stStaffdentified that some members of the community are unaware of the programme (Fig. 5). Additionally, the centres are funded through a private CSR partner rather than government initiatives and 56% of stStaffdentified this as a risk due to the lack of government resources and benefits (Fig. 7). Therefore, policymakers should acknowledge the importance of community initiatives and link these to government initiatives to improve accessibility of computers, internet and government initiatives. Learners should also be informed of the opportunities available to them, using local languages wherever possible (Chauhan, Visnu and Kumar 2025). Furthermore, policies should look to provide training and employment support. As 56% of students expected employment support from the NGO (Fig. 4a), employment support should be included in these programs. This is especially important as students rarely have access to computers at school (Fig. 2a); only 9% had regular access, 50% had rare access, and 41% had no access. Therefore, most students expect additional computers from the Government (Fig. 4b).

### 8.2 CSR partners and NGOs

Whilst the CSR funding has enabled the program to run, it appears there are limited resources to meet learners' needs fully. 28% of students wanted the NGO to provide more computers (Fig. 4a). Staff also identified that there were limited resources (33%) and outdated resources (22%) (Fig. 5). To ensure successful community initiatives, there should be sufficient internet, up-to-date computers, sufficient practice time, and skilled mentors; however, only 11% of Staff identified a lack of skilled mentors. Sundesh and corporate partners should therefore review their current resources and focus on the most important aspects. Courses should be tailored to meet learners' needs and expectations. As AI becomes increasingly important, new modules should be added to teach students the latest technologies. Students wanted to learn AI tools the most (31%), with advanced MS Office (28%) and graphic design/video editing (22%) coming next (Fig. 3b). However, 38% had already learned about AI tools in the center (Fig. 3a). As 56% of students expected employment support from the NGO, career guidance and mentoring should be regularly provided.

Programs should be measured on different criteria. Whilst it is important to measure how many students have signed up and how much it costs to run, this may not always reflect how successful it is. Therefore, programs should have clear objectives to ensure that learners gain

the appropriate amount of knowledge (Gahlot & Verma, 2026). As it is dependent on one company (Dabur India Limited) for CSR funding, there are risks. Staff identified limited scale of support (56%), lack of government resources and benefits (56%), funding ceasing/stable (33%), and being dependent on one donor's priorities (11%) (Fig. 7). Therefore, alternative funding options should be investigated. Government initiatives, CSR from other companies, and community-based organizations could help provide more stable funding. Finally, Staff identified inconsistent attendance as the most common issue (56%), due to family and work commitments (Fig. 5). Therefore, flexible class times should be considered, and families should be involved to help students attend regularly.

### 8.3 Schools and Educators

Schools that do not provide much or any access to computers should take responsibility for improving students' digital skills. In this chapter, 41% of students had no access to computers at school, and 50% had limited access (Fig. 2a). Schools can support community initiatives by integrating digital literacy into their regular curriculum. This will enable the centers to provide more advanced courses, as learners will have some basic knowledge. Ongoing training and mentoring should be provided. One-off training is often lost over time; however, providing training with feedback helps teachers to continue using digital skills in the classroom (Lorenz, Banister and Kikkas 2015).

### 8.4 Research and Theory

This chapter has contributed to digital inclusion research. Most research focuses on national surveys; however, this chapter has provided data from a local initiative. It has shown that skills and guidance are important. All students had a smartphone; however, only 25% had a computer (Fig. 1a). This is consistent with a study conducted in Chile, which found that people with only a mobile phone had lower digital skills (Correa et al., 2020). The findings regarding dependence on a single funder support resource dependency theory. This states that organizations that rely heavily on a single funder will be affected by changes in that funder's requirements (AbouAssi & Tschirhart, 2018). This chapter has also provided perspectives from both Staff and learners. Future research could compare them more directly (Mohapatra, Vyas and Chakraborty 2026).

### 8.5 SDGs

The research findings relate to several of the UN Sustainable Development Goals. The community initiative helps provide quality education (4), with 94% of students learning MS Office and 38% learning AI tools. It also provides decent work and economic growth (8), as 56% of students expect employment support. The Sundesh programs highlight the importance of technology and access to ICT (Target 9.c). They also highlight the importance of working with companies and community initiatives to ensure these programs can continue (9: Industry, Innovation & Infrastructure).

### 8.6 Limitations and Future Directions

This chapter had some limitations. A small sample size (32 students and 9 staff) was used, and convenience sampling was employed. It was also self-reported. Whilst the aim was to identify the needs and expectations of the local community, the findings cannot be generalized. Future research should be conducted using a larger survey to represent the wider population. Longitudinal research should also be conducted to identify any long-term effects of community initiatives. In this chapter, Staff were asked about their awareness of government schemes; however, future research should also include students. Researchers could also look into how using more public initiatives/resources alongside community centers like Sundesh's can help learners move on to further study/work. These limitations highlight the contribution this chapter has made to future research around community initiatives to improve digital literacy.

## 9. Conclusion

Digital inclusion is not only about access to computers, the internet, or even smartphones, but also about having the opportunity, support, and skills required to use the technology appropriately. The study reveals, from the experience of Sundesh Foundation's Computer Literacy Centers in the rural areas of Ghaziabad, that access to technology does not necessarily mean access to appropriate learning with technology. Although most students have access to smartphones and the internet at home, their limited exposure to computers limits their opportunities to develop practical digital skills.

The lack of computers and reliable internet connections can create a significant barrier to providing computer education in rural schools. This can leave students with insufficient practical experience using computers and affect their preparation for future studies and job opportunities. Computer Literacy Centers, such as those run by Sundesh Foundation, provide computer education to students who may lack opportunities to access and use computers, helping them develop their computer skills. Such organizations create opportunities for rural students to access computer education and develop their skills.

However, students may find it difficult to improve their computer skills without sufficient time to practice regularly. As many of them have limited access to computers at home and at school, they may have fewer opportunities to practice what they have learned. Because of this, it can be difficult for them to become confident in using computers on their own. So, giving students more time for regular practice and proper guidance can help them become more familiar with computers and apply these skills in their studies and future opportunities.

The research found that the success of digital literacy programs lies more in providing computers and organizing classes than in simply providing computers and organizing classes. Problems such as limited awareness, outdated computers, lack of resources, and irregular attendance due to family or personal responsibilities can make it difficult for students to benefit fully from these programs. These challenges also show us that students may not have the same needs or face the same difficulties while learning digital skills. Therefore, it is important to understand the community and the students facing such challenges before deciding how to improve these programs.

Flexible class timings could help students manage their daily routines and attend classes more regularly, with enough time to practice and proper guidance to build their confidence in using

computers. Similarly, updating the computers and software could allow students to practice a wider range of skills. These programs should help the students understand how digital skills can be applied to their studies, everyday activities, and future job opportunities.

The findings also show that digital education in rural areas requires support from various organizations, including government bodies, schools, NGOs, and companies. CSR funding has helped make these programs possible and shows how other corporate firms can contribute to the development of rural communities. However, relying on a single private funding source may make it difficult to continue and expand these initiatives in the future. Support from government programs and cooperation between different institutions could help reduce this dependence and make digital education more sustainable in the long term.

Alongside providing resources, it is important to evaluate whether students are actually benefiting from these programs. Enrolling students and providing them with computers does not necessarily mean that effective learning has taken place. Their progress should also be evaluated through the skills they develop, their confidence, and their ability to use computers in their studies and their daily lives.

The findings relate to three Sustainable Development Goals: SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 9 (Industry, Innovation, and Infrastructure). Such community-based initiatives can help improve computer education in rural India by providing access to computers and developing practical digital skills. They also want to learn skills that may help them in their future job opportunities. So, providing better infrastructure, regular practice, and high-quality training is also important for helping students use these skills and prepare for future employment. Such efforts can help reduce the digital gap between rural and urban communities.

However, the responses from the students and NGO staff provided useful insights into their experiences, challenges, and expectations. Future research involving more centers and a longer study period could provide a better understanding of the long-term impact of digital literacy on students' education and their career opportunities.

Overall, this chapter has shown that meaningful digital inclusion is not just about providing access to computers, but also about giving students opportunities to develop skills they can use in their daily lives. Sundesh Foundation's Computer Literacy Centers have provided rural students with opportunities to learn computer skills, although there is a gap in facilities and practical learning. With these improvements, students can make better use of what they learn, helping them to gradually reduce the digital gap between rural and urban communities.

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