

Research Article

Impact of COVID-19 on Virtual Schooling: Insights from Elementary School Teachers in Aspirational Districts of the North-East Region of India

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Abstract

The study investigated the social, economic, and technical impacts of COVID-19 on elementary school education, with a focus on the challenges and barriers to virtual schooling in the North-East Region of India. Approved and funded by the Government of India through the Ministry of Education, it utilized primary data collected from 224 elementary school teachers across 20 randomly selected schools in aspirational districts during the 2022–23 academic session across all states of the North-East Region. Findings showed that 87% of teachers had actively participated in online teaching, though inadequate infrastructure, limited resources, and insufficient training had posed significant challenges. Teachers had adapted to online teaching through platforms such as WhatsApp, YouTube, Zoom, and DIKSHA, while advanced tools like virtual labs and QR-code-enabled textbooks had been underutilized. Support materials had been only partially available, and systemic issues—such as the lack of digitization, online evaluation tools, and funding—had constrained virtual learning. Programs such as NISHTHA had provided training to 70% of teachers, though participation in MOOCs and SWAYAM had been notably low. Teachers had reported significant psycho-social challenges among children, including isolation, anxiety, reduced physical activity, and disengagement—particularly among disadvantaged children and those experiencing personal losses. Strategies such as counselling, home visits, and remedial teaching had been employed to address these challenges. The study underscored teachers' resilience during the pandemic while highlighting the need for enhanced digital infrastructure, training, and psycho-social support to ensure inclusive online education. It had proposed recommendations addressing infrastructure development, teacher training, governance and policy support, psycho-social assistance, alternative learning methods, enhanced collaboration, and specialized learning materials, aiming to bridge existing gaps and ensure that virtual schooling became effective, inclusive, and aligned with NEP-2020's goals to foster equitable and quality learning opportunities for all.

Keywords

Aspirational Districts, COVID-19 Pandemic, Online Learning, Psycho-Social Support Initiatives, Virtual Schooling

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Received: 18 July 2025; **Accepted:** 14 August 2025; **Published:** 8 September 2025



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1. Introduction

The Government of India (GOI) had introduced the National Education Policy (NEP) 2020 in July 2020, during the COVID-19 pandemic, with a focus on quality, innovation, competency-based education, equity, and digital initiatives. The aspirational districts in India were underdeveloped regions as identified by the NITI Aayog [10] for focused improvement in health, education, agriculture, infrastructure, and governance to accelerate inclusive development. The NEP 2020 had prioritized enhancing children's learning outcomes by achieving Foundational Literacy and Numeracy (FLN) in primary schools by 2025. It had emphasized that without foundational skills in reading, writing, and arithmetic, the broader goals of the policy would have held limited significance for many children. To address this, the GOI had launched the National Initiative for Proficiency in Reading with Understanding and Numeracy (NIPUN) Bharat Mission in a mission-mode approach to ensure every child achieved the necessary competencies in FLN by Class/Grade III, or at the latest by Class/Grade V, by 2026-27.

During the same period, the country had faced multiple lockdowns to control the spread of COVID-19, which had led to school closures, particularly in rural areas. In response, the GOI had issued guidelines for online and distance learning, necessitating virtual schooling as an alternative approach to traditional in-person schooling for teaching [5]. This shift from offline to online school education had highlighted the importance of teachers' computer literacy and internet access for effective remote teaching. Supportive measures and a positive outlook had been critical for boosting teachers' morale and improving the teaching-learning environment after pandemic disruptions [2].

NEP 2020 had also acknowledged the transformative potential of technology in education while recognizing its associated risks. It had emphasized equitable access to digital learning and had called for well-structured pilot studies to explore the effective use of online education, aiming to maximize benefits and mitigate challenges [7]. Learning through online platforms had presented significant challenges due to the geographical and temporal dispersion of children [6]. Understanding these difficulties had been crucial, as unresolved issues could have led to stress, anxiety, and potentially severe mental health problems [11, 9]. In the absence of a vaccine or effective treatment for COVID-19 during the pandemic, online education had become a long-term necessity, demanding ongoing adaptation.

Future crises such as pandemics, the Teesta River floods in Sikkim, Delhi's air pollution, or Bengaluru's heavy rains had highlighted the urgent need for children worldwide to adapt to online learning. Integrating science and technology into school education had been crucial for better preparedness [1]. Meanwhile, a research programme funded by the GOI-Ministry of Education's Programme Advisory Board

had been carried out in 2022–23 by the Department of Elementary Education at National Council of Educational Research and Training (NCERT), New Delhi. This programme had examined how COVID-19 had impacted online schooling in aspirational districts of Northeast India, addressing concerns from children, teachers, parents, community members, and government officials [12]. Against this backdrop, this research paper—an outcome of the research programme—had explored elementary school teachers' perceptions of the COVID-19 pandemic's impact on virtual schooling, with a specific focus on aspirational districts in Northeast India.

2. Objectives of the Study

In alignment with NEP-2020, with a focus on aspirational districts, this research paper had sought to explore elementary school teachers' perspectives on the positive and negative impacts of the COVID-19 pandemic on competency-based learning among elementary school children in selected aspirational districts of the North-East Region. This study had aimed to examine the impact and severity of COVID-19 on elementary schooling through two key objectives, namely,

- 1) To assess schools' readiness and preparedness for implementing online or virtual teaching-learning methods, and
- 2) To evaluate the effects of COVID-19 on the psycho-social well-being of elementary school children.

3. Research Methodology

The study used a mixed-methods design that integrated both quantitative and qualitative data collection. It followed a teacher schedule tailored to meet its objectives as part of a research programme commissioned by the GOI-Ministry of Education [12]. For this purpose, a teacher schedule was developed, reviewed by an expert group, tried out in actual field conditions, validated and finalised for primary data collection. It aimed to evaluate elementary school teachers' perceptions of their schools' preparedness for online teaching and to analyze the pandemic's effects on elementary school children during the 2022–23 academic year in the North-East Region.

The teachers' schedule focused on key areas of investigation, and included data-items on - teaching classes through online mode during COVID-19, preparedness for online teaching-learning during lockdown period (teacher's preparedness, school's preparedness, preparedness of governance), feedback of teachers on training for online teaching, teachers' feedback on the use of alternative teaching and learning methods, teachers' response on portal (s)/channels/apps used for online teaching, teachers' response to adopted modes of teaching and comfort for online teaching, training received by teachers for conducting online classes, additional strategies employed by teachers for e-learning in the teaching-learning

process, teaching skills employed by teachers on fulfilling individual children's learning needs, teachers' feedback on use of teacher energized resource manual and other resource materials during online teaching, teachers' feedback on the use of specialised e-resources and other applications/ resource materials for online teaching, teachers' perception of physical or mental stress due to online classes, teachers' response for dealing with children's struggle with mental health and personal issues, teachers' perception on providing psycho-social support through the GOI Initiatives on Psychosocial Support for Mental Health and & Well Being of Students during the COVID Outbreak and Beyond (MANODARPAN / SAHYOG / KIRAN), teachers' perception of psycho-social health of children due to online classes, and teachers' observations on problems related to psycho-social health among children due to online classes.

The study was conducted in eight aspirational districts from North-East States, namely, Namsai, Hailakandi, Chandel, Ribhoi, Mamit, Kiphire, Gyalshing, and Dhalai belonging to the States of Arunachal, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura, respectively. The schools were randomly selected under control of the State Governments (State Samgra Shiksha Abhiyan Mission Authorities) having Class VII and VIII for the study. These selected schools were co-educated schools, and affiliated to the State Education Boards. Two schools were randomly chosen from each State for primary data collection. As such, 16 schools were selected from all eight districts covering all States of North-East Region for data collection. For trying-out of teacher's schedule, two schools were randomly selected from the aspirational districts of Mizoram and Sikkim, thereby four schools were used to pilot-testing of the schedule. The primary data collection ultimately involved 20 randomly selected schools, with the schools serving as sampling units,

randomly chosen based on the administrative support offered by district authorities.

Primary data collection was carried out in person, overseen by the State Nodal Officers appointed by State Authorities. The responses, which included both closed- and open-ended data, were entered into MS Excel for processing, tabulation, and analysis following the methodologies described by research workers [3, 4, 8].

The study carefully incorporates ethical practices—such as informed consent, safeguards for stakeholders, and protocols for data confidentiality—to uphold integrity, respect, and accountability throughout the process of collecting primary data from schools.

4. Data Presentation and Analysis

To collect primary data, a structured schedule was used to engage school teachers who were randomly chosen from 20 schools across all states of the North-East Region. A total of 224 teachers participated voluntarily after data validation. Among them, 119 were male, 98 female, and 7 preferred not to disclose their gender. The participants included 133 teachers from Scheduled Tribes (STs), 30 from Minority Groups, 29 from Other Backward Classes (OBCs), and another 29 from Other Social Groups. This section presents and analyzes their perspectives on virtual schooling implemented during the COVID-19 pandemic.

4.1. Teaching Classes Through Online Mode During COVID-19

The responses of teachers regarding conducting classes online during COVID-19 are illustrated in Figure 1.

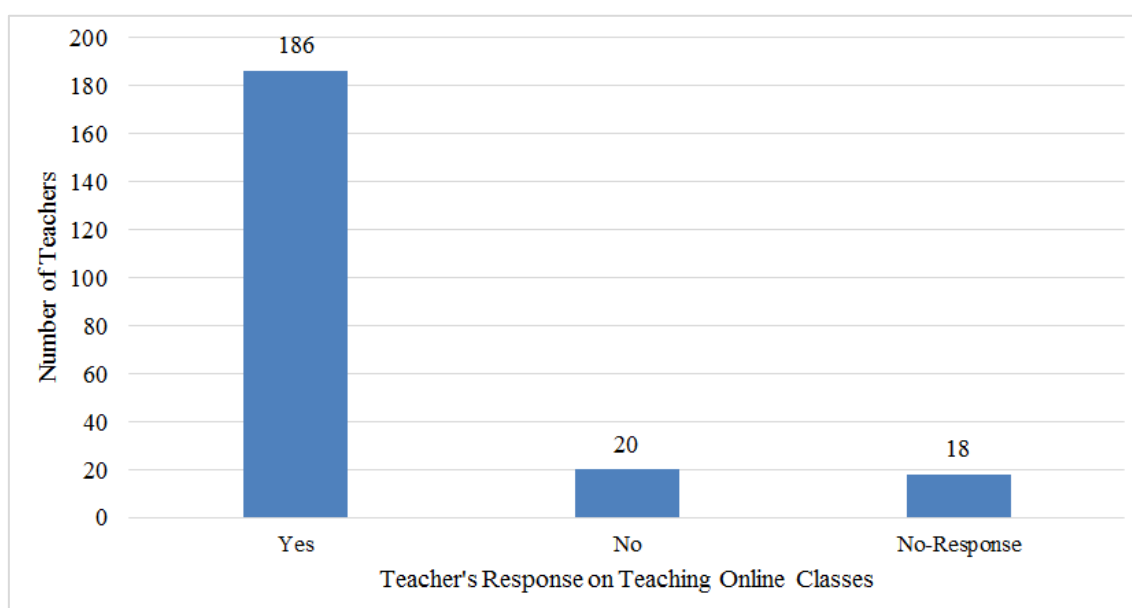


Figure 1. Teacher's Response on Teaching Classes through Online Mode during COVID-19.

The data revealed that approximately 17% of teachers responded negatively (either with a "no" or no response). Among the sampled teachers, 186 (representing 87%) reported being actively involved in online teaching. These teachers primarily conducted online classes for children in Grades VI through X, covering subjects such as Bengali, Biology, Chemistry, English, Hindi, Mathematics, Mizo, Physics, Science, and Social Studies.

On average, teachers reported spending 2.35 hours per day conducting online classes, with the duration ranging from 1.13 to 3.57 hours per day, as stated by the 186 participants. Additionally, they dedicated an average of 1.89 hours daily, with variations ranging from 0.76 to 3.02 hours, preparing for these online lessons.

Some teachers noted that instead of online teaching, they supported children through alternative methods such as phone calls, providing notes and worksheets, sending study materials, assignments, and videos via WhatsApp, or conducting in-person classes in areas less affected by the pandemic, especially in rural regions during the COVID-19 lockdown.

4.2. Preparedness for Online Teaching-Learning During Lockdown Period

Teachers' feedback was gathered using a data item that assessed the preparedness of schools for online teaching and learning during the COVID-19 lockdown, focusing on three key dimensions: Teacher, School, and Governance.

A. Teacher's Preparedness: The COVID-19 pandemic had significantly disrupted the elementary education system, forcing an unplanned and rapid transition to online teaching and learning during the lockdown. The effectiveness of this shift largely depended on teachers' ability to adapt to new pedagogical methods and roles. This study focused on evaluating teachers' preparedness for online teaching, considering factors such as training, hands-on experience, access to gadgets and internet connectivity, provision of separate remuneration or rewards, and administrative orders and support services. Figure 2 illustrated the findings on teachers' readiness for online teaching.

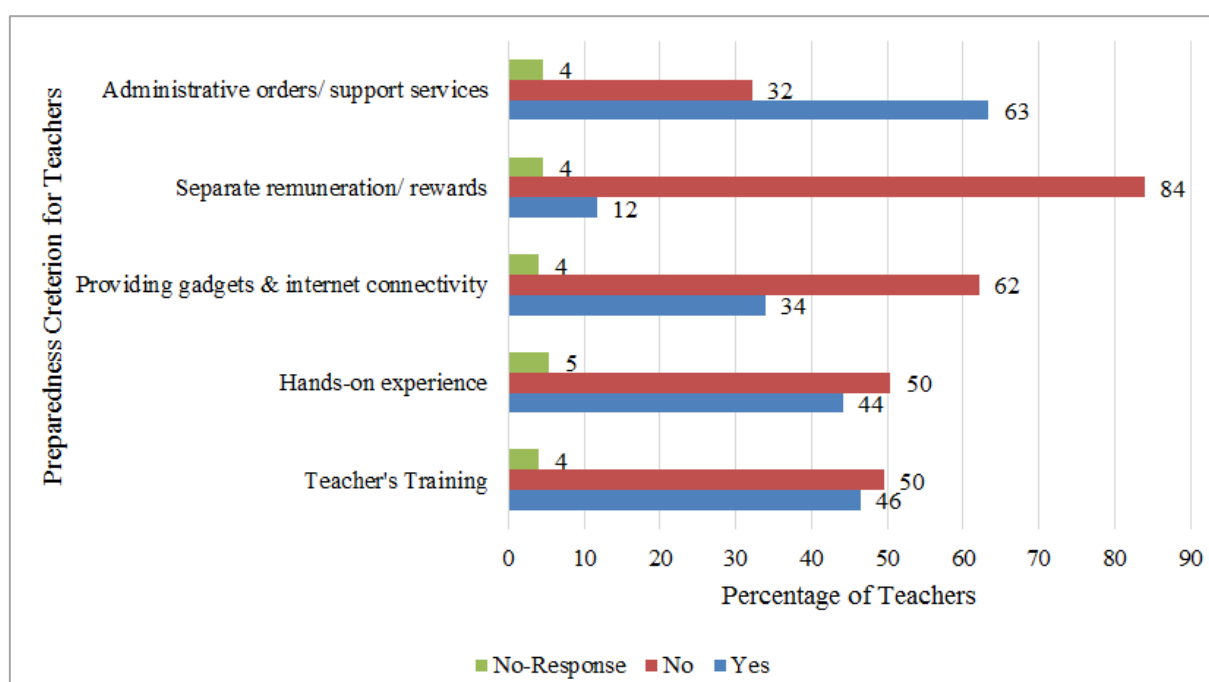


Figure 2. Teacher's Preparedness for Online Teaching-Learning.

The results showed that preparedness criteria, including separate remuneration/rewards, access to gadgets and internet connectivity, hands-on experience, and training, were reported as very poor, with percentages ranging from 50% to 84%. However, 63% of teachers indicated that they received administrative orders to enhance their preparedness for online teaching during the pandemic.

B. School's Preparedness: The onset of COVID-19 in

the North-East Region in March 2020 necessitated a swift shift to remote learning, compelling schools to address an unprecedented crisis. Teachers provided insights into how pre-pandemic planning was adapted to remote learning practices and the schools' confidence in maintaining children's academic progress during the pandemic. In this context, teachers highlighted various aspects of school preparedness for

online teaching, including the development of week-wise plans aligned with NCERT's alternative academic calendar, the availability of ICT laboratories equipped for online classes, procurement of new equipment to address online learning challenges, ac-

quisition of licenses for online platforms, digitization of teaching-learning resources, and the use of online portals for evaluation. Figure 3 had presented the findings on school readiness for online teaching-learning during the lockdown.

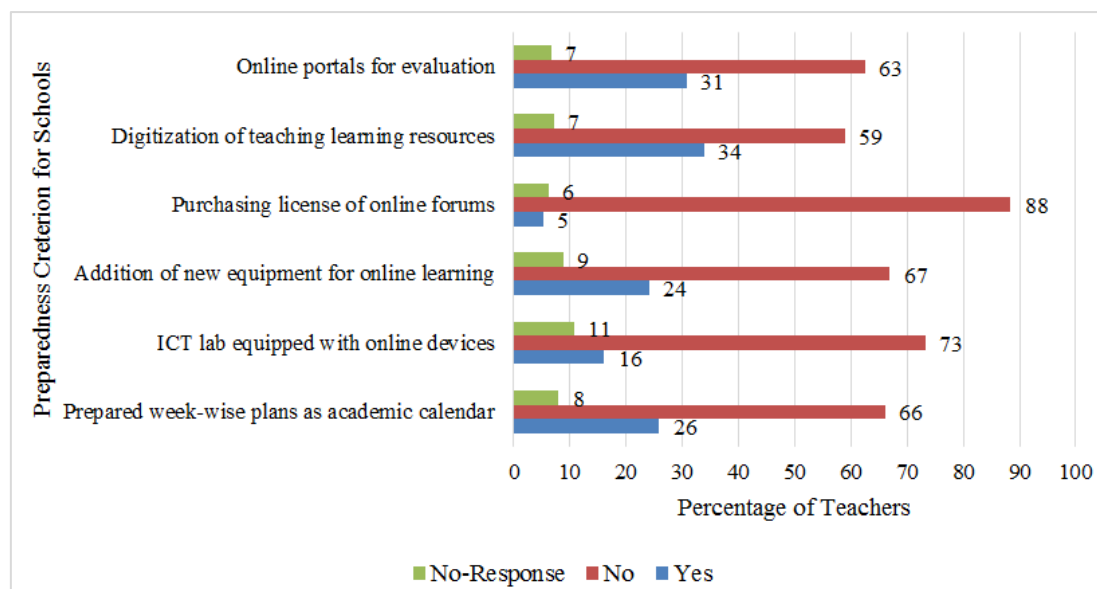


Figure 3. School's Preparedness for Online Teaching-Learning.

Documenting schools' teaching-learning practices had been crucial to understanding the conditions required to provide equitable access to quality education. However, as shown in

Figure 3, schools' preparedness on the evaluated indicators had been largely inadequate or very poor.

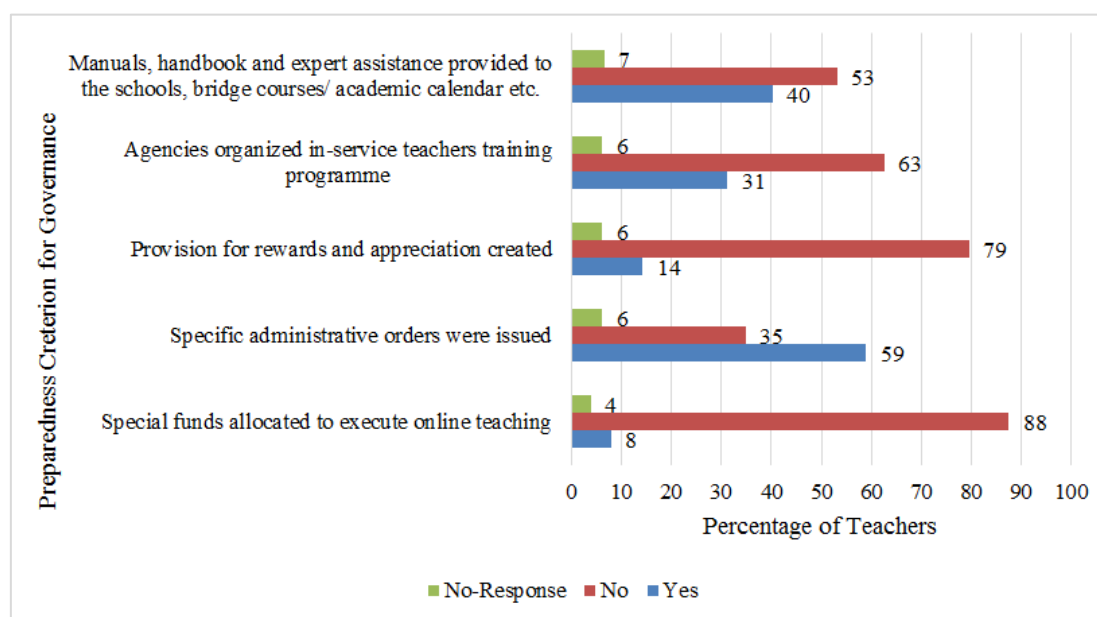


Figure 4. Preparedness of Governance for Online Teaching-Learning.

C. Preparedness of Governance: The GOI introduced

various initiatives, while State Governments imple-

mented internal and external auditing measures to ensure quality education and reduce the challenges associated with e-learning. Multiple e-learning strategies and digital courses were developed to support online teaching-learning for school education. In this context, teachers were surveyed on their perspectives regarding the governance preparedness based on specific criteria, namely, allocation of special funds for implementing online teaching-learning, issuance of specific administrative orders, provision of rewards and recognition for efforts in online teaching, organization of in-service training programs for teachers by relevant agencies, and availability of manuals, handbooks, expert guidance, bridge courses, and academic calendars for schools. Figure 4 had illustrated governance preparedness for online teaching-learning based on these indicators.

According to the teachers' responses, the highest level of governance preparedness (59%) was reported for the issuance of specific administrative orders by authorities, followed by 40% for the provision of manuals, handbooks, expert guidance, and academic resources. However, only 8% of respondents noted preparedness in terms of special fund allocations to facilitate online teaching during the pandemic.

4.3. Teachers' Feedback on Training for Online Teaching

The NEP 2020, under Para 24 on online and digital education, emphasized the need for equitable use of technology and adequate teacher training to become effective online educators. The policy acknowledged that a competent teacher in a traditional classroom may not automatically excel in an online teaching environment. Existing e-learning platforms such as Digital Infrastructure for Knowledge Sharing (DIKSHA), Study Webs of Active-Learning for Young Aspiring Minds (SWAYAM), and Swayam Prabha TV Channels would be

expanded to offer teachers a structured, user-friendly set of tools to assist in monitoring learners' progress. Additionally, tools like two-way video and audio interfaces for conducting interactive online classes were recognized as essential, a need underscored by the COVID-19 pandemic.

Approximately 70% of teachers had received training under National Initiative for School Heads' and Teachers' Holistic Advancement (NISHTHA) programme through offline or online modes. However, it was noteworthy that the NISHTHA program was originally designed for offline training. Only 0.01% of teachers attended the Massive Open Online Courses (MOOC) training program, while 12% participated in the SWAYAM program for online teaching. The responding teachers reported on various modules included in these training programs, outlined namely as, competency-based and activity-based learning, health and well-being in schools, initiatives in school education, art-integrated learning, including inclusive education, and capacity building of teachers on the implementation of pre-vocational education, curriculum and inclusive classrooms, development of personal and social quality, learner-centred pedagogy, DIKSHA-FLN Course, FLN, and K-yan smart classes.

4.4. Teachers' Feedback on the Use of Alternative Teaching and Learning Methods

Learning delivery had involved various methods, including face-to-face training, virtual classrooms, online learning, blended learning, and mobile learning. However, during the COVID-19 lockdown, teachers' schedules also included data on the use of alternative approaches to teaching and learning, namely, the distribution of textbooks at home to children, telephonic guidance by teachers, online and digital content through TV/radio, SMS, textbooks, worksheets and other print materials, WhatsApp, YouTube, and learning applications on a smartphone, visits to children's home/community, live teaching-learning sessions, any other.

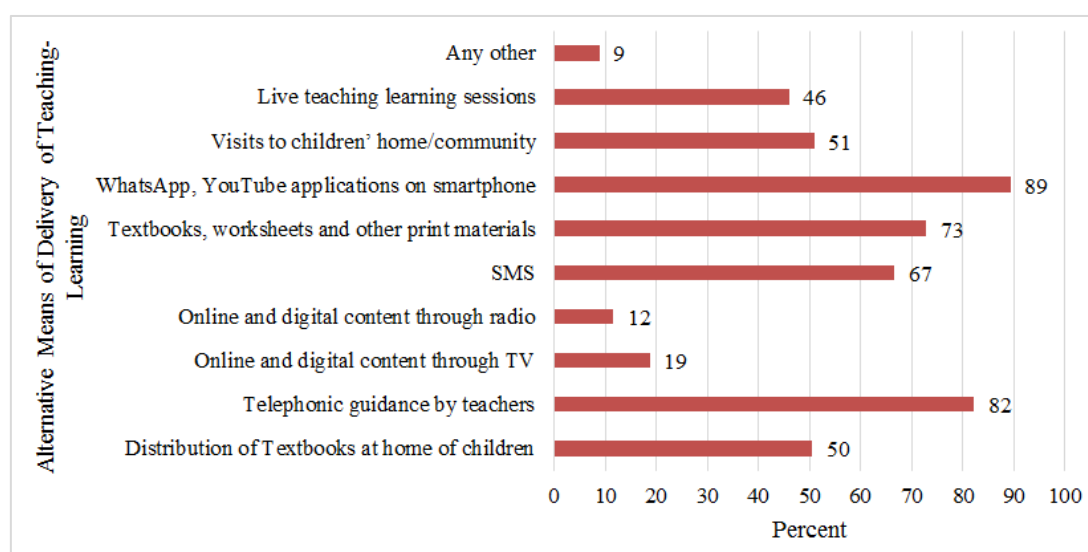


Figure 5. Teachers' Response on Use of Alternative Means of Delivery of Teaching-Learning.

Figure 5 had illustrated teachers' responses, expressed in percentage points, regarding the use of alternative teaching-learning methods during the COVID-19 lockdown.

The findings indicated that a majority of teachers—89%—used smartphones to deliver instruction through platforms like WhatsApp and YouTube. Telephonic guidance was the next most common approach, adopted by 82% of teachers, while 73% relied on textbooks, worksheets, and other printed materials. Conversely, less popular methods included delivering online and digital content via television (19%), radio (12%), and other alternative means (9%).

4.5. Teachers Response on Portal(s) / Channels / Apps Used for Online Teaching

The pandemic brought significant changes to India's school

education system. With schools forced to close, the Government introduced various initiatives, and online teaching platforms experienced a sudden surge in popularity. These platforms offered flexible and convenient ways for children to learn and teachers to teach, providing access to diverse educational content and resources. To assess the adoption of these online teaching platforms, a data item was included in teachers' schedules on the use of portals, channels, and applications for online teaching. The platforms mentioned included DIKSHA, the National Repository of Open Educational Resources (NROER), E-Pathshala, Swayamprabha TV Channels, Gyanvani-FM, Mukta Vidya Vani, Radio Vahini (Community Radio Station), Shiksha Vaani, Talking Books, the National Digital Library (NDL) of India, Zoom, Google Classroom, and Google Meet. Figure 6 highlighted the reality of teachers' responses in this regard.

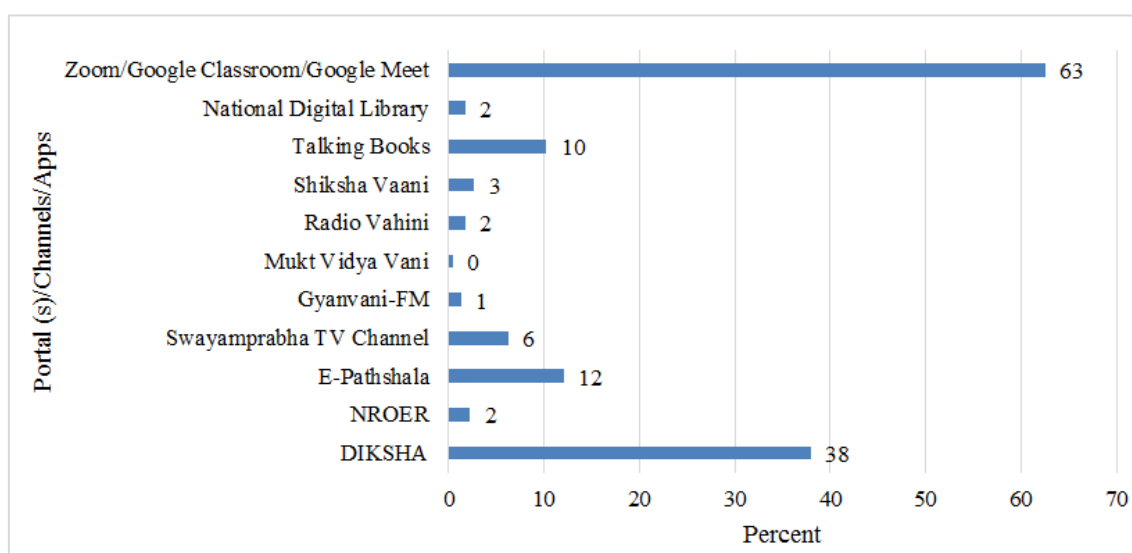


Figure 6. Teachers Response on Portal (s)/Channels/Apps used for Online Teaching.

Figure 6 revealed that the majority of Government-led initiatives in the public domain were largely underutilized or unused by teachers during the pandemic lockdown. The notable exception was the DIKSHA portal, utilized by 38% of teachers. In comparison, 63% of teachers relied on Zoom, Google Classroom, and Google Meet for conducting online classes.

Teachers also reported that they contacted children primarily through verbal communication on mobile phones and shared pre-recorded video clips via WhatsApp for online teaching.

The responses span across Classes V to X and encompass a diverse range of subjects, including Biology, Mathematics, English, Health Education, Social Studies, Science, and regional languages such as Manipuri, Hindi, and Bengali. To facilitate instruction and engagement, teachers utilized multiple communication and learning platforms, including

WhatsApp, Google Meet, Zoom, YouTube, NISHTHA Module 12, and Swayam Prabha – Channel No. 25. This multi-channel approach reflects a concerted effort to ensure accessibility and continuity in education across varied academic levels and linguistic contexts.

Furthermore, a significant majority of the responding teachers had not utilized QR-coded textbooks (65%) or O-laboratories/virtual laboratories (84%). This limited usage could be attributed to a lack of awareness and training among teachers in the North-East Region during the pandemic lockdown.

4.6. Teachers' Response to Adopted Modes of Teaching and Comfort for Online Teaching

Online teaching and learning, a technology-driven approach, had gained significant popularity during and after the

COVID-19 pandemic. It could be integrated into lessons or used to deliver entire courses through a robust learning management system managed by public authorities. In recent years, there had been a notable increase in children using mobile devices to access course materials and resources for school education. Online learning enabled teachers to provide children with flexible access to materials, including pre-recorded lectures and other resources, at their conven-

ience. A typical online course comprised of multiple lessons, each featuring video lectures, reading materials, external links, practice activities or games, and assessments. In the context of online teaching, Table 1 highlighted teachers' responses regarding their chosen teaching modes and comfort levels with these modes during the lockdown, expressed in percentage points.

Table 1. Teachers' Response on Adopted Modes of Teaching, and Comfort for Online Teaching.

Modes of Teaching	Teachers Response on Teaching during Pandemic Lockdown (in Percent)	
	Adopted Mode for Teaching	Comfortable Mode for Teaching
a. Face-to-Face	29	74
b. Online	54	12
c. Blended (Face-to-Face & Online)	13	11
d. Non-accessibility	4	3

According to the data, 54% of teachers adopted online teaching, followed by 13% who preferred a blended or hybrid teaching approach. Meanwhile, 29% of teachers opted for face-to-face teaching, and 4% reported no access to teaching opportunities. Regarding comfort levels, 74% of teachers indicated they were most comfortable with face-to-face teaching, while 23% expressed comfort with either online or blended teaching methods during the pandemic lockdown.

4.7. Training Received by Teachers for Conducting Online Classes

During the COVID-19 pandemic, various agencies at national, state, and district levels organized training to equip teachers for conducting online classes. Teachers reported participating in training programs delivered through platforms such as DIKSHA, NISHTHA, K-yan Smart Class, and Gurushala, which were facilitated by organizations like NCERT, State Council of Educational Research and Training (SCERT), District Institute of Educational Training (DIET), and State Education Departments. Most of these training sessions were short, lasting less than a week (12%) or up to one week (6%). However, despite several government guidelines and initiatives mentioned in public documents, the overall training opportunities for online teaching remained limited.

The training content focused on topics like art-integrated learning, e-content development, audiobooks for foundational literacy and numeracy, health and wellness, and the use of online teaching tools such as Zoom, Google Meet, and K-yan Digital Class. Additionally, NISHTHA modules aimed at

improving teaching methodologies for subjects like language, mathematics, and science were included to enhance teachers' skills. Regarding the training's effectiveness, 45% of teachers who attended found it "very useful," 47% considered it "useful," and the remainder rated the training as "not useful at all."

4.8. Additional Strategies Employed by Teachers for E-Learning in Teaching Learning Process

Teachers provided feedback on a four-point rating scale—"to a great extent," "to a large extent," "to some extent," and "not at all"—regarding the extent to which they utilized additional strategies for incorporating e-learning into the teaching-learning process. These strategies included using audio-visual aids, creating blogs or YouTube channels, developing tools for conference communication, uploading and sharing audio-visual materials, and other similar approaches. Figure 7 had presented the details about additional strategies adopted by teachers for e-learning.

Figure 7 revealed that teachers predominantly chose the "to some extent" category for activities such as using audio-visual aids (40%), creating tools for conference communication (36%), uploading and sharing audio-visual materials (35%), developing blogs or YouTube channels (23%), and other strategies (7%). However, for most of the suggested approaches—excluding the use of audio-visual aids—more than 55% of teachers indicated they had not employed them at all.

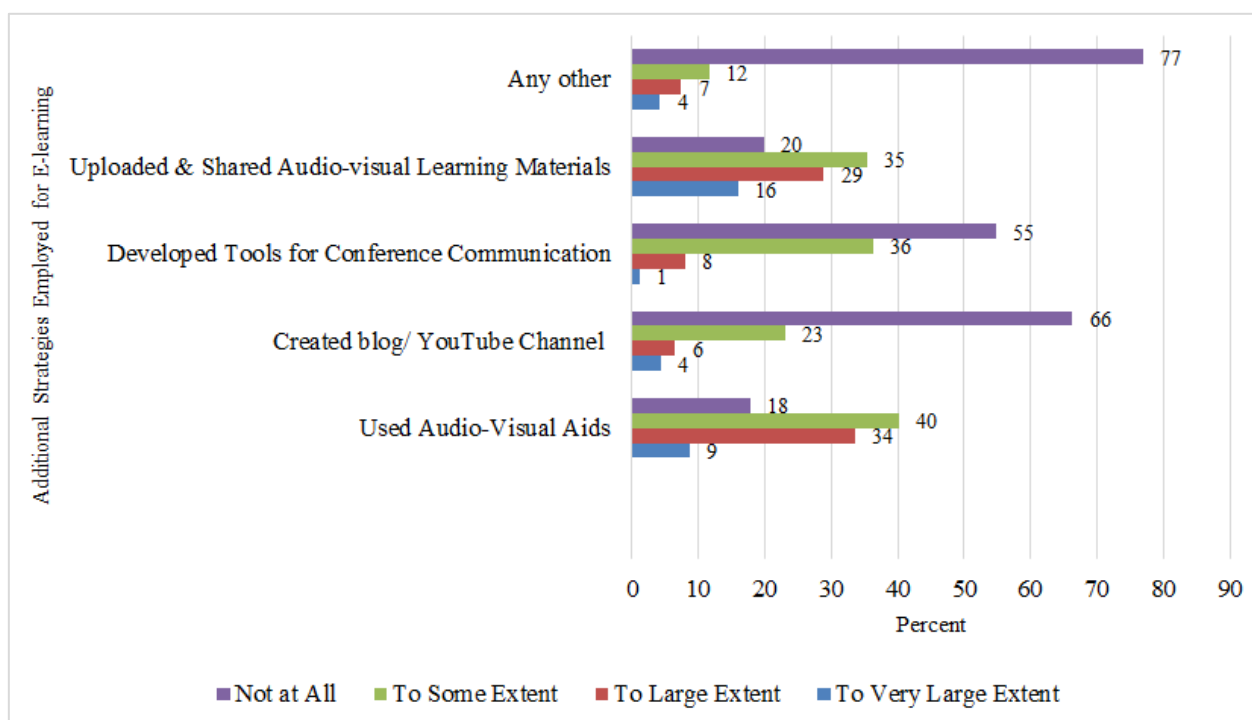


Figure 7. Additional Strategies Employed by Teachers for E-learning in Teaching Learning Process.

4.9. Teaching Skills Employed by Teachers on Fulfilling Individual Child's Learning Needs

Teachers were asked to describe how they utilized their teaching skills to address individual child's learning needs during the lockdown. Their responses included the following:

- 1) *Engaging with Children's Queries:* Teachers encouraged children to ask questions and share their queries, assisting them with solutions. They posed various questions about lessons, sought feedback, and encouraged individual participation in online learning. Children were also invited to share doubts or contact teachers individually for clarification.
- 2) *Using Communication Tools:* Teachers collected children's contact numbers, formed WhatsApp groups, and shared important notes. They also contacted children individually to share videos and provided additional time to ensure thorough understanding.
- 3) *Supporting Struggling Children:* Teachers identified the needs of academically weaker children in specific subjects and informed parents about their children's performance. Remedial teaching sessions were arranged to support these children.
- 4) *Home Visits and Personal Interaction:* Teachers visited children's homes to interact with parents, discuss challenges, distribute worksheets, and offer online tutorials. They also connected with children directly via phone to provide additional support."

4.10. Teachers' Feedback on Use of Teacher Energized Resource Manual and Other Resource Materials During Online Teaching

The Central Board of Secondary Education (CBSE), in line with the shift toward outcome-based education, had developed the Teacher Energized Resource Manual (TERM) to help teachers align their classroom practices with a competency-based framework. TERM had aimed to provide educators with competency-focused resources aligned with NCERT textbooks to facilitate the achievement of learning outcomes and the development of essential competencies in children. Each TERM chapter had corresponded to an NCERT textbook chapter and had included a detailed list of concepts, NCERT-developed learning outcomes, and specific learning objectives. It had also featured competency-based test items and sample enrichment activities for each learning objective.

To assess the adoption of TERM, a data point was included in the teachers' schedule. The findings revealed that approximately 86% of teachers reported not using TERM, while only 6% of teachers indicated they had utilized the resources. Those who did use TERM often did so after discussions with school headteachers, School Management Committee (SMC) members, and teacher trainers. Additionally, some teachers made use of the learning recovery and enhancement package developed by the SCERTs in collaboration with United Nations Children's Fund, United Nations International Children's Emergency Fund.

Teachers' responses regarding the use of resource materials, such as MOOCs/DIKSHA modules on experiential learning, competency-based learning, and activity-based learning, during online teaching were collected. The results showed that 43% of teachers primarily used activity-based learning modules, followed by 41% who used MOOCs/DIKSHA modules on experiential learning, and 27% who utilized competency-based learning modules as resource materials during the pandemic lockdown period.

4.11. Teachers' Feedback on the Use of Specialised E-Resources and Other Applications/ Resource Materials for Online Teaching

Information was collected regarding the use of specialized e-resources and other application/ resource materials by teachers for online teaching, including resources related to the Programme for International Student Assessment (PISA), creativity, critical thinking, and other applications. Upon analyzing the data, it was found that teachers used resources related to PISA (2%), creativity (34%), critical thinking (33%), and other application/resource materials (35%), respectively. The additional application/resource materials used by teachers included:

- 1) Academic packages provided by the Department of School Education and SCERTs.
- 2) Digital boards displayed through video conferencing (Google Meet) for problem-solving and chemical reactions.
- 3) DIKSHA and E-pathshala applications.
- 4) Various alternative Teaching Learning Materials (TLMs) prepared by teachers.
- 5) Educational tools like Zoom, smartphones, Google services, and consultations with fellow teachers.
- 6) Platforms like Vedantu, Biju, YouTube, TLM simulations, virtual labs, toy-based pedagogy materials, plays, radio programs, digital learning, and print materials.
- 7) Resources developed by CBSE, NCERT (e.g., PDF/MS Word documents, textbooks, NCERT solutions available on the web portal).

4.12. Teachers' Perceptions of Stress and Their Response to Children's Mental Health Challenges in Online Classes

The widespread adoption of online classes has improved access to course materials. However, several research studies suggested that prolonged screen time negatively impacts mental and physical health, contributing to stress, depression, sleep disorders, eye strain, postural pain, and musculoskeletal issues. To explore this further, teachers were surveyed about the physical and mental stress experienced by children during the pandemic, and they responded as below:

A. Impact of Online Classes on Physical and Mental Health

- 1) Increased Accessibility – Online classes improved access to course materials but led to new challenges.
- 2) Negative Health Effects – Prolonged screen time contributed to stress, depression, sleep disorders, eye strain, postural pain, and musculoskeletal issues.
- 3) Teachers' Observations on Children's Stress – About 45% of teachers reported that children experienced physical and mental stress due to:
 - a) Limited access to smartphones, especially in remote areas.
 - b) Prolonged sitting, leading to physical discomfort.
 - c) Social isolation, anxiety, and lack of motivation.
 - d) Poor network connectivity and financial struggles of families.
 - e) Difficulty maintaining discipline and engaging students.
 - f) Increased eye strain, headaches, and mental fatigue.
 - g) Unmet learning goals due to syllabus gaps and connectivity issues.
 - h) Teachers facing exhaustion due to workload and pressure from parents and students.

B. Challenges Faced by Teachers in Online Teaching

- 1) Lack of Digital Skills – Many teachers were unprepared for online teaching and required additional training.
- 2) Increased Workload & Stress – Teachers had to manage lesson planning, student engagement, and their own mental and physical health.
- 3) Difficulty in Maintaining Work-Life Balance –
 - a) Teachers set aside specific hours for lesson planning and student support.
 - b) Some implemented 'tech-free' hours to manage stress and avoid burnout.

C. Teachers' Strategies for Supporting Children's Mental Health

- 1) Phone-Based Support – Teachers provided counseling via phone calls.
- 2) Individual & Group Counselling – Special attention was given to children facing mental health challenges.
- 3) School-Level Mental Health Programs – Training sessions were conducted to support students' well-being.
- 4) Home Visits – Some teachers visited students' homes to offer direct support.
- 5) Limitations – Despite efforts, some teachers were unable to fully address students' needs due to various constraints.

4.13. Teachers' Perceptions and Observations on the Psycho-Social Impact of Online Classes on Children

The outbreak of the Coronavirus disease created a signifi-

cant threat to millions of children engaged in online learning. The transition from in-person to online classes had led to psychological and psycho-social distress among children. However, the Government of India had introduced various initiatives and issued guidelines to address these challenges. This section would provide the teachers' perceptions and observations on the psycho-social impact of online classes on children.

A. Teachers' Perceptions

In context to teachers' perceptions about the impact of COVID-19 on psycho-social well-being of children due to online classes were assessed through the following data statements:

- 1) Children could not maintain a positive outlook and suffered from anger, and tension due to loss of touch

with schools and school classmates/ friends.

- 2) Children failed to interact in online classes due to anxiety.
- 3) Children felt isolated which further affected their motivational level due to learning individually at home.
- 4) Lack of physical activities affected the child's mental health.
- 5) Digital awareness mitigates mental- health issues arising due to online learning.
- 6) MANODARPAN/ SAHYOG/ KIRAN etc. mitigate psycho-social issues.

Table 2 presented teachers' perceptions of the impact of online classes on the psycho-social health of children in percentage points for the responding teachers.

Table 2. Teacher's Perception about the Effect of COVID-19 on Psycho-social Health of Children due to Online Classes.

S. No.	Statements	Teacher's Perception (in Percent)				
		Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
1.	Children could not maintain a positive outlook, and suffered from anger, and tension due to loss of touch with schools and school classmates.	16	43	29	11	1
2.	Children failed to interact in online classes due to anxiety.	10	38	29	20	3
3.	Children felt isolated which further affected their motivational level due to learning individually at home.	17	51	21	10	1
4.	Lack of physical activities affected child's mental health.	32	49	10	8	1
5.	Digital awareness mitigates mental- health issues arising due to online learning.	15	38	31	14	2
6.	MANODARPAN/ SAHYOG/ KIRAN etc. mitigate psycho-social issues.	6	20	56	10	8

The results, as shown in Table 2, revealed that teachers' perceptions were indicating that –

- 1) Almost 59% of teachers believed that children struggled to maintain a positive attitude and experienced anger and stress due to being disconnected from schools and their classmates/friends.
- 2) 48% of teachers felt that anxiety prevented children from engaging in online classes.
- 3) 68% of teachers observed that children felt isolated and were learning alone at home, which led to a decrease in their motivation.
- 4) 81% of teachers noted that the lack of physical activities had a negative impact on children's mental health.

- 5) 53% of teachers felt that digital awareness helped reduce the mental health issues caused by online learning.

- 6) 26% of teachers believed that initiatives like MANODARPAN, SAHAYOG, and KIRAN helped address psycho-social challenges.

B. Teachers' Observations

Teachers' observations on psycho-social health issues among children due to online classes were documented. Around 29% of the responding teachers provided positive feedback regarding these problems. In support of their observations, teachers described the nature of these issues and explained how they addressed them, as outlined in Table 3 below:

Table 3. Teachers' Observations on Nature of Problems and Ways to Address the Psycho-social Health Issues among Children Due to Online Classes.

Nature of Problems	Ways Teachers Addressed the Problems
1. Anger and disruptive behaviour among children.	1. Advised children to limit smartphone use.
2. Reduced mental health due to lack of physical activity and disengagement outside classes.	2. Individual communication with children and parents; encouraged group work.
3. Difficulty in socializing; increased screen time; addiction to smartphones/online games.	3. Used 3-D videos and visuals to keep children engaged.
4. Reluctance to attend online classes among children who lost parents during the pandemic.	4. Contacted parents/guardians to discuss problems and solutions.
5. Poor concentration and minimal peer communication.	5. Motivated children to participate in indoor games, exercises, and similar activities.
6. Lack of social interaction leading to psycho-social issues.	6. Used appropriate TLM and psycho-social activities.
7. Isolation and fear of COVID-19 causing anxiety and low confidence.	7. Organized mental health and well-being training sessions.
8. Lack of participation in social activities.	8. Guided children on adapting to and managing online learning changes.
9. Laziness in completing notes, homework, and assignments.	
10. Decline in interest in studies, emotional struggles.	
11. Anger and disruptive behaviour due to isolation.	
12. Inability to attend classes due to health issues.	
13. High stress from isolation from peers/social gatherings.	
14. Worries over poor network connectivity.	

5. Findings

The teacher's schedule had been used to assess the impact of COVID-19 on virtual learning among elementary school children under the administrative control of the State Samagra Shiksha Abhiyan Mission Authorities in selected aspirational districts of the North-East Region. The study sample had included 224 teachers from 20 randomly chosen schools, primarily teaching Class VII and VIII. The study had examined schools' readiness and preparedness for implementing online teaching methods, with a particular focus on the psycho-social well-being of elementary school children. The key findings were as follows:

- 1) Online Teaching Engagement – 87% of teachers conducted online classes, spending an average of 2.35 hours daily on teaching and 1.89 hours on preparation.
- 2) Teacher Preparedness – Inadequate training, internet access, and resources (50-84%), though 63% received administrative orders for online teaching.
- 3) Support Materials – Teachers used DIKSHA modules (41%), competency-based (27%), and activity-based learning resources (43%).
- 4) Infrastructure Gaps – Lack of online evaluation portals

(63%), digitized teaching materials (59%), online platform licenses (88%), and well-equipped Information and Communication Technology (ICT) labs (73%).

- 5) Governance Challenges – 53% of schools lacked manuals/handbooks, 63% had no in-service training, and 88% received no special funds for online teaching.
- 6) Teacher Training – 70% received NISHTHA training, but participation in MOOCs (0.01%) and SWAYAM (12.1%) was low.
- 7) Use of E-Resources – Teachers used digital resources related to creativity (34%) and critical thinking (33%).
- 8) Alternative Teaching Methods – WhatsApp and YouTube were used by 89% of teachers, 82% provided telephonic guidance, and 51% conducted home visits.
- 9) Online Platforms – Zoom, Google Classroom, and Google Meet were used by 63%, while DIKSHA was the most popular government initiative.
- 10) Teaching Approaches – 54% used online lectures, 13% adopted blended learning, and 40% used audio-visual tools.
- 11) Individual Learning Support – Teachers engaged students through interactive questions, WhatsApp groups, remedial sessions, and worksheets.

- 12) Government Initiatives – Only 8% of teachers participated in support programs like MANODARPAN, SAHAYOG, and KIRAN.
- 13) Psycho-Social Challenges – Teachers observed mental health concerns, including social isolation (68%), anxiety (48%), lack of physical activity (81%), and academic disengagement among disadvantaged children (89%).
- 14) Pandemic-Related Trauma – Children who lost parents showed reluctance to join classes and lacked interest in assignments.
- 15) Mental Health Interventions – Teachers supported children through telephonic counselling, group sessions, well-being training, and home visits.

6. Conclusions

This study, grounded in the vision of NEP-2020 and focused on aspirational districts in the North-East Region, set out to assess both schools' readiness for online or virtual teaching-learning and the effects of COVID-19 on the psycho-social well-being of elementary school children. The findings reveal that while a large proportion of teachers (87%) embraced online teaching, their efforts were constrained by systemic gaps in infrastructure, digital resources, and capacity-building opportunities. Basic platforms like WhatsApp, YouTube, Zoom, and DIKSHA were widely used, but integration of more advanced digital tools and structured online assessment methods remained limited.

In terms of psycho-social well-being, teachers observed heightened levels of anxiety, isolation, reduced physical activity, and disengagement—especially among disadvantaged children and those affected by personal loss. In response, teachers demonstrated adaptability and commitment by employing targeted interventions such as counselling, remedial teaching, and home visits.

Overall, the research highlights both the resilience of the teaching workforce and the urgent need to strengthen digital infrastructure, enhance teacher training in technology-enabled learning, and integrate sustained psycho-social support into school systems. Addressing these priorities will not only improve preparedness for future disruptions but also contribute to the NEP-2020 goal of fostering competency-based, inclusive, and holistic education for all children, even in the most underserved geographies.

7. Recommendations

The research study provided valuable insights into the challenges and opportunities associated with virtual schooling during the COVID-19 pandemic, focusing on elementary school teachers in aspirational districts of India's North-East Region.

Based on the presented data, analytical insights, and re-

search findings, a set of strategic recommendations has been identified to support the digital transformation of elementary education in alignment with the NEP - 2020. These recommendations span critical domains including infrastructure enhancement, educator training and capacity development, governance and policy reinforcement, psycho-social support mechanisms, innovative learning methodologies, strengthened stakeholder collaboration, and the development of specialized digital learning resources. The proposed measures are outlined as follows:

- 1) Infrastructure Development
 - i. Invest in digital infrastructure such as ICT labs equipped with devices and reliable internet connectivity in schools.
 - ii. Create digitized teaching-learning resources and online evaluation tools to ensure seamless virtual learning.
- 2) Training & Capacity Building
 - i. Expand teacher training programs like NISHTHA to include more modules on virtual teaching methodologies and digital tools.
 - ii. Offer advanced and ongoing training in e-learning platforms and specialized tools such as QR-code-enabled textbooks and virtual laboratories.
- 3) Governance & Policy Support
 - i. Allocate specific funds for virtual schooling and provide clear administrative directives to enhance readiness.
 - ii. Develop and disseminate manuals, handbooks, and academic calendars tailored to online learning.
- 4) Psycho-Social Support
 - i. Increase awareness of government initiatives like MANODARPAN, SAHYOG, and KIRAN to mitigate psycho-social challenges among children.
 - ii. Organize regular counselling sessions, remedial teaching, and community visits to address isolation, anxiety, and mental health concerns.
- 5) Alternative Learning Methods
 - i. Encourage blended learning approaches where possible, combining face-to-face and online instruction for better engagement.
 - ii. Promote tools such as WhatsApp, YouTube, and telephonic guidance for remote teaching, alongside distribution of print materials for areas with limited digital access.
- 6) Enhanced Collaboration
 - i. Foster collaboration among teachers to share innovative strategies for virtual schooling, such as developing YouTube channels and conference tools.
 - ii. Facilitate partnerships with organizations like NCERT and SCERTs to access quality e-resources and teaching aids.
- 7) Specialized Learning Materials
 - i. Develop competency-based, experiential, and activity-based learning modules accessible to all schools in

- aspirational districts.
- ii. Ensure the availability of user-friendly platforms like DIKSHA and SWAYAM for both teachers and students.

The recommendations sought to bridge gaps in areas such

as infrastructure, training, governance, psycho-social support, and educational resources, ensuring that virtual schooling became both inclusive and effective, in line with the principles of NEP-2020.

Abbreviations

CBSE	Central Board of Secondary Education
COVID-19	COronaVIRus Disease of 2019
DIET	District Institute of Educational Training
DIKSHA	Digital Infrastructure for Knowledge Sharing
FLN	Foundational Literacy and Numeracy
GOI	Government of India
ICT	Information and Communication Technology
MANODARPAN / SAHYOG / KIRAN	GOI Initiatives on Psychosocial Support for Mental Health and & Well Being of Students During the COVID Outbreak and Beyond
MOOC	Massive Open Online Courses
NCERT	National Council of Educational Research and Training
NDL	National Digital Library
NEP	National Education Policy
NIPUN	National Initiative for Proficiency in Reading with Understanding and Numeracy
NISHTHA	National Initiative for School Heads' and Teachers' Holistic Advancement
NROER	National Repository of Open Educational Resources
OBCs	Other Backward Classes
PISA	Programme for International Student Assessment
SCERT	State Council of Educational Research and Training
SMC	School Management Committee
STs	Scheduled Tribes
SWAYAM	Study Webs of Active-Learning for Young Aspiring Minds
TERM	Teacher Energized Resource Manual
TLM	Teaching Learning Materials

Acknowledgments

The authors gratefully acknowledge the Government of India, Ministry of Education, Department of School Education and Literacy, New Delhi, for providing a dedicated grant to support this research. They also extend sincere appreciation to the State Samagra Shiksha Abhiyaan Authorities/ Officials from the North-East Region of India for their ongoing and invaluable assistance throughout the study and data collection process. The authors further thank all participating school teachers for their enthusiastic involvement during data collection. All procedures adhered to ethical standards and contextual appropriateness. Participation was entirely voluntary, and the data collected from teachers remained fully anonymous, gathered through structured survey and focus group discussions. The survey instrument excluded any personally sensitive questions. All data were analyzed in aggregate form and utilized solely for educational and research objectives.

Author Contributions

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Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] Ali, I., & Alharbi, O. M. L. (2020). COVID-19: Disease, management, treatment, and social impact. *Science of the Total Environment*, 728: 1–6. <https://doi.org/10.1016/j.scitotenv.2020.138861>
- [2] Bhat, R., Singh, V. K., Naik, N., Kamath, C. R., Mulimani, P., & Kulkarni, N. (2020). COVID 2019 outbreak: The disappointment in Indian teachers. *Asian Journal of Psychiatry*, 50, 102047. <https://doi.org/10.1016/j.ajp.2020.102047>
- [3] Cox, J. (1996). *Your opinion, please: How to build the best questionnaires in the field of education*. Thousand Oaks, CA: Corwin.
- [4] Daniels, D. H., Beaumont, L. J. & Doolin, C. A. (2002). *Understanding children: An interview and observation guide for educators*. Boston: McGraw-Hill.
- [5] Dhawan S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. *Journal of Educational Technology Systems*, 49(1): 5-22. <https://doi.org/10.1177/0047239520934018>
- [6] Endler, A., Rey, G. D., & Butz, M. V. (2012). Towards motivation-based adaptation of difficulty in e-learning programs. *Australian Journal of Educational Technology*, 28(7): 1119–1135. <https://doi.org/10.14742/ajet.792>
- [7] GOI (2020). *National Education Policy – 2020*. GOI-Ministry of HRD, New Delhi.
- [8] Kumar, R., (2019). *Research Methodology: A Step-by-step Guide for Beginners*. Sage Publications Limited.
- [9] Majumdar, P., Biswas, A., & Sahu, S. (2020). COVID-19 Pandemic and Lockdown: Cause of sleep disruption, depression, somatic pain, and increased screen exposure of office workers and children of India. *Chronobiology International*, 37(8): 1191–1200. <https://doi.org/10.1080/07420528.2020.1786107>
- [10] NITI Aayog, (2018). Aspirational Districts Baseline Ranking, March 2018. <https://www.niti.gov.in/aspirational-districts-programme>
- [11] Singh, G. (2020). Unstable Education System Inducing Mental Stress in COVID-19 Lockdown. *Open Access Macedonian Journal of Medical Sciences*, 8(T1): 248–249. <https://doi.org/10.3889/oamjms.2020.5093>
- [12] Singh (2023). *Effects of Virtual Schooling on Learning Outcomes of Elementary School Children in Selected Aspirational Districts of the North-East Region*. Unpublished research report (GOI-MoE-DSE&L-PAB approved activity), submitted to the GOI- MoE-DSE&L, New Delhi.