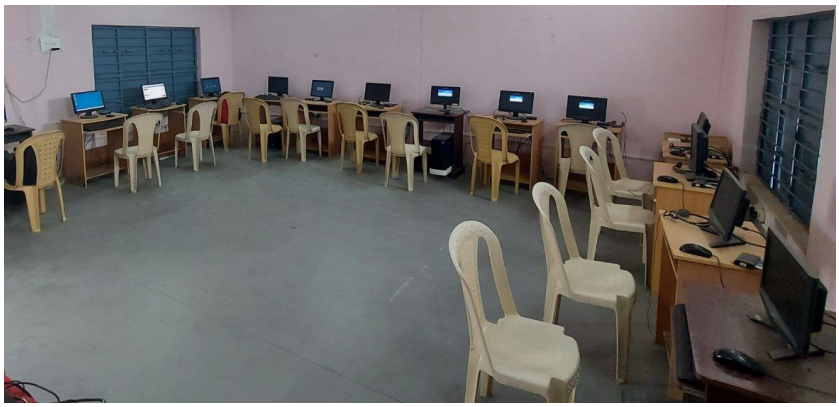
CLIx Phase 2 Evaluation Report



IT for Change
August 2022

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Executive Summary

The Centre of Excellence in Teacher Education (CETE), Tata Institute of Social Sciences (TISS) launched the Connected Learning Initiative (CLIx) in 2015 with an aim to "improve teaching, teacher professional development and student learning through the use of Information and Communication Technology (ICT)-enabled Open Education Resources (OER), and thoughtful use of interactive technologies". Phase 1 of CLIx concluded in 2020, and the second phase was initiated with an aim to scale quality teaching-learning using ICT with teacher professional development and curricular integration. Given the unprecedented challenges due to the sudden disruption in teaching-learning processes brought about by the Covid-19 pandemic, several alternate/new strategies were adopted by CLIx to address the needs of school systems. In the interest of understanding the progress made so far on one hand and informing the way forward with the experience and the learnings of the last two years, a third party midterm assessment of the activities of the second phase between April 2020 and March 2022 was undertaken by IT for Change. The evaluation was designed to assess the program implementation in context, identify aspects that have been conducive to the implementation of the program and areas that need improvement and on this basis, provide recommendations for consideration.

The fundamental approaches and strategies of CLIx in terms of promoting teacher collaboration, active and collaborative learning, open software and resources, and state ownership are in the right direction, specially at a time when the whole discourse on EdTech is steering away from core educational values towards "learnification". The CLIx model is an alternative to this model of ICT integration, and continued and significantly enhanced investment into the program is crucial to ensure that the principles, processes and products of CLIx sustain in the system.

Key Findings

1. In both states, the implementation teams hold an excellent rapport with all stakeholders. At the onset of the COVID-19 pandemic, CLIx pro-actively took measures to respond to the requirements of the department and support thousands of CLIx and non-CLIx teachers, HMs and other stakeholders by conducting trainings to help them deal with the challenges posed by the sudden disruption in teaching-learning.
2. Teachers opine that CLIx modules and OERs are well-designed as they are contextual and present content in a way that is engaging for students. However, according to teachers and HMs, the subject areas and the number of modules per subject are limited and even the ones currently available are not fully in alignment with the new syllabus.

3. Several stakeholders reported that while the online trainings and courses were useful, there were limited opportunities for hands-on practice.
4. The ICT lab infrastructure, which is a critical component of the CLIx program, is in a less-than-desirable state in both Telangana and Chhattisgarh.
5. In Telangana, the district reorganization coupled with teacher transfers has resulted in many of the CLIx trained teachers shifting to non-CLIx schools that do not have functional lab set-ups. Teachers who have not undergone CLIx courses/trainings and who are unfamiliar with the CLIx modules/resources, are using them in the ICT lab on being assigned to CLIx schools. Additionally, several district and sub-district officials have been newly appointed and have not been fully acquainted with the trainings, modules, work and functioning of CLIx.

Key Recommendations

1. Continued and significantly enhanced investment into the program is necessary. The credibility that the program and the trust hold with the department must be consciously leveraged to persuade the department to invest in the necessary hardware and teacher preparation based on the needs of stakeholders.
2. CLIx offers a sustainable and scalable model that strengthens the capacities in the public education system and necessary investments and support, financial and otherwise, on the part of the government need to be made.
3. Supplementary training programs for all stakeholders across the state would be essential to ensuring that the knowledge and capacities built over time through the CLIx program are sustained within the system.
4. Design and development of additional CLIx modules covering more topics and subject areas can give teachers further incentive to adopt and utilise the modules and thereby integrate ICT in their teaching learning processes.
5. Efforts could be made for teachers to imbibe more deeply the principles behind integrating ICT in education – the need and importance of OERs, sharing and collaboration with peers, etc. so that their pedagogical imagination for ICT in education could expand to include creation and curation of OERs as well.

1. Introduction and Background

The Connected Learning Initiative (CLIx) is a field action program launched by the Centre of Excellence for Teacher Education (CETE), TISS to improve teacher education and the professional and academic prospects of high school students from underserved communities in India through the use of ICT-enabled Open Education Resources (OER). CLIx is currently in its third operational year and aims to "incorporate thoughtful pedagogical design and leverage contemporary technology, including online capabilities, to provide quality educational content and experiences at scale in the areas of Mathematics, English and Science".

Phase 2 of CLIx focuses on promoting sustainable good practices for interactive ICT OER adoption within state systems, and by teachers and teacher educators. The focus is on technology in education in general and the use of CLIx resources as a context for implementing ICT in education in collaboration with state and other entities.

CLIx Phase II was proposed in December 2019 with the aim to build upon the learning from Phase 1 and continue the efforts in 6 thematic areas:

1. Teachers' professional development through certificate courses, trainings, and communities of practice
2. Developing expertise for the curation and creation of OERs through design labs
3. Research
4. Policy & advocacy
5. New collaborations for scaling & adaptation
6. Technical support to the state for managing scale and quality.

Considering the sudden disruption in teaching-learning processes brought about by a complete lockdown of educational institutions due to the pandemic, certain challenges arose such as delays in activities due to a shift in state priorities to respond to the COVID situation, reduced interactions with state and district officials for program planning as well as reduced access to students due to school closure and no clarity on when they would open. Other challenges included less access to devices and stable internet and teachers not being well versed in the use of online tools for webinars and meetings. These challenges, as elaborated on in the Quarterly Progress Reports, meant that the implementation teams of CLIx phase 2 in both Telangana and Chhattisgarh had to adapt the proposed plans to cater to the changed circumstances and provide extra support and trainings to teachers, school heads and state and district officials.

In the interest of understanding the progress made so far on the one hand and informing the project's way

forward with the experience of the last few years and the learnings thereof, this 3rd party assessment of CLIx (Phase II) was carried out for the project activities implemented in the States of Chhattisgarh and Telangana between April 2020 and February 2022. The assessment was conducted between March 2022 and May 2022 with the support from the CLIx team in facilitating data collection both online and in the field.

2. Scope of Assessment

The key tasks of the assessment were to understand the context of disruptions in teaching-learning brought about by Covid-19, assess the strategies adopted by CLIx to maintain continuity in teaching-learning processes, and provide recommendations. In this context, the defined scope includes:

1. Assessment of whether the partnership with the State has been synergistic and identification of further areas of engagement.
2. Assessment of whether the teachers, resource persons and other stakeholders whose capacities were built over time through CLIx have been able to respond better to the challenges brought about by Covid-19.
3. Assessment of activities carried out under Phase II of CLIx including the response to challenges posed by the pandemic.
4. Assessment of strategies to support stakeholders in adopting technology in education, OER integration into the curriculum, scaling of the program, etc
5. Identification of good practices in implementation
6. Recognition of enabling and disabling factors for implementation and the identification of areas requiring re-design.

3. Evaluation Design

In this assessment, a mixed method design involving qualitative and quantitative analyses was used to answer the evaluation questions. The evaluation focuses on the implementation of various program-related activities. It provides feedback on how activities could be improved, and if any changes in the design or implementation process may be required. In order to do this, a careful examination of process documents and other relevant records was taken up at the start of the evaluation process. A multi-method, multi-audience approach was then adopted to collect both qualitative and quantitative data and information from teachers, resource persons, CRPs, BEO/MEO & other govt. officials, and students. Through this process, the evaluation team attempted to capture significant changes in terms of knowledge, skills, practice and attitudes of the stakeholders, as well as some unexpected outcomes of the program.

3.1 Evaluation Framework

The evaluation framework maps each evaluation question and component of assessment to the respective sources and methods of data collection.

Evaluation Questions	Indicators	Data Sources	Methods
Has partnership with the State been synergistic and what could be further areas of engagement?	Signed MoUs, Ed-tech committee formation and meetings, buy-in from state in terms of investment,	- Educational functionaries (state, district and sub-district officials) - Implementation teams - Reports and documents	- Key Informant Interviews - Document Analysis
Have the teachers, resource persons and other stakeholders whose capacities were built over time through CLIx, been able to respond better to the challenges brought about by Covid-19?	Stakeholders' knowledge/skill levels in usage of ICT tools for different purposes,	- Resource persons - Teachers - Other stakeholders	- Online survey - Focus group discussions - Key informant interviews
How effective were activities carried out under Phase II of CLIx, including the response to challenges posed by the pandemic?	Stakeholders' perceptions about CLIx modules and OERs, stakeholders' perceptions about trainings and workshops	- Resource persons - Teachers - Other stakeholders	- Online survey - Focus group discussions - Key informant interviews
How effective were the strategies to support stakeholders in adopting technology in education, OER integration into the curriculum, scaling of the program, etc?	Participation of stakeholders in capacity building activities, reported usage of ICT tools by stakeholders for different purposes, stakeholders' perceived knowledge/skill levels in ICT usage,	- Resource persons - Teachers - Other stakeholders	- Online survey - Focus group discussions - Key informant interviews
What were some good practices in implementation?	Inferences from study of various components of CLIx program	- Reports and documents - interactions with stakeholders	- Document Analysis - Focus group discussions - Key informant interviews
In what way were some factors enabling and disabling for the implementation of the program and how might the corresponding areas be improved/re-designed?	Qualitative and quantitative analysis of the collected data, inferences from interactions with stakeholders	- Reports and documents - interactions with stakeholders	- Document Analysis - Focus group discussions - Key informant interviews

4. Methodology

4.1 Sampling

Different evaluation questions required inputs from different stakeholders in the program like teachers, resource persons, school leaders, education department officials (SPD, BEO/MEO, CRP), students, etc. The sampling process took into account the characteristics of the data needed for analysis and the feasibility of obtaining it to make decisions about the sample size, sampling methods, and the tools and techniques for data collection.

A stratified sampling approach was applied to obtain a sample of the total number of stakeholders covered by phase 2 of CLIx for the purpose of carrying out an online survey. On the other hand, a purposive sampling of stakeholders was done for conducting focus group discussions (FGDs) and key informant interviews (KIIs) through one-on-one interactions. Parameters for the purposeful sampling included factors like geography, characteristics of school, subject and grades taught by a teacher, CLIx courses and trainings attended, access to devices and internet, etc. These FGDs and KIIs, when conducted with stakeholders who had already participated in the online survey, helped obtain deeper qualitative insights. In Telangana, the evaluation team visited the districts of Warangal, Hanumakonda, and Karimnagar while in Chhattisgarh, the team visited Durg, Dhamtari and Raipur districts to carry out the face-to-face FGDs and KIIs. Before and after these field visits, a survey, review of documentation, discussions with the CLIx team, KIIs, and FGDs were also conducted in the online mode. The details of these data collection tools are given in the next section while the exact number of stakeholders sampled from each state are given in the table.

Stakeholder	**Mode of Data Collection**	**Telangana**	**Chhattisgarh**
		Sample	**Sample**
Teachers / Resource Persons	Online survey	243	26
Teachers / Resource Persons	Interview/FGD	10	26
HMs	Interview/FGD	11	-
State and District Officials	Interview	2	5
Sub-district officials(SOs and CRPs)	Interview/FGD	8	-
Students	FGD	-	5
School/Lab visit	-	1	2
CLIx implementation team	Interview/FGD	4	5
Total		**279**	**69**

4.2 Data Collection Tools

Review of Documentation

The documents provided by the CLIx team such as Quarterly Reports, Activity Plans, Training reports as well as those documents and records procured during the field visits were examined. The review and studying of this documentation informed the design of the remaining tools and supported the analysis and interpretation of the collected data.

Online Survey

An online survey questionnaire for teachers and resource persons was administered through bilingual online survey forms (one for Telangana and one for Chhattisgarh) which enabled a larger number of stakeholders from different locations in both states to participate in the study. The online survey received 243 responses in Telangana and 26 in Chhattisgarh. Given the difference in the numbers, the findings may not be directly comparable between the 2 states. The data collected from these surveys was largely quantitative in nature covering aspects related to ICT usage, CLIx modules and OERs, trainings/courses attended, CoP groups, etc. The questionnaire along with Telugu and Hindi translated versions can be found in the annexe.

Focus Group Discussions

The FGDs were intended to be conducted in-person wherever possible with around 15-20 participants in a group. In Telangana, due to overlaps with another government training program being conducted and some logistical constraints with respect to travel, the FGD with HMs was done virtually and that with CRPs was done face-to-face. In Chhattisgarh, over 20 teachers were able to participate in the FGDs in face-to-face mode. In both online and face-to-face mode, the FGDs allowed for a dynamic discussion between participants. In this process, their thoughts could be stimulated by the experiences shared by peers and the answers to prompts and questions were elaborated or discussed in more detail.

Key Informant Interviews

These one-on-one interviews were conducted both online (using video conferencing) as well as in-person (during the field visits to Chhattisgarh and Telangana). The interactions provided , insights into the effectiveness of the program by enabling the evaluation team to understand perspectives of the stakeholders more clearly. It also ensured that there was room for the interviewer to explain and clarify any doubts during the process of data collection.

5. Observations and Findings

5.1 Capacity building of teachers and other stakeholders

Trainings and Workshops:

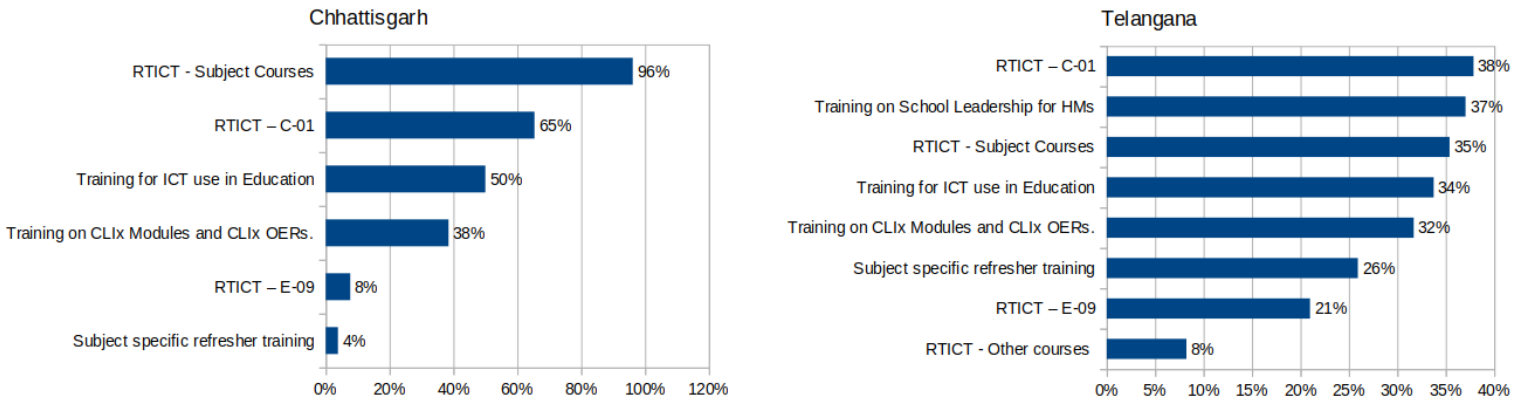

Figure 1: Training programs/courses attended by respondent teachers

* Percentages don't add up to 100 because respondents may have attended multiple trainings/courses

Figure 1 shows that in Telangana, there is a roughly equal distribution of respondent teachers and RPs who have attended the RTICT courses and those who have attended other trainings related to subject specific CLIx modules/OERs. In Chhattisgarh almost all respondent teachers and RPs have attended their subject-specific RTICT course and about half of them have attended trainings on using CLIx modules, OERs and other ICT tools for teaching-learning. Further insights from the in-person interactions with stakeholders are discussed below:

1. The RTICT online course was a good way to reach teachers who were not possible to be contacted in schools or through workshops. In Chhattisgarh, Samagra Shiksha allocated funding for the course fees of teachers. The methodology of voluntary registration for learning was effective in ensuring that teachers took ownership for their own learning and progress in the course, and were motivated to complete course requirements. The focus group discussions that we had clearly showed that the teachers' enthusiasm about the program, about what the program entails and what the program stands for, were quite clear.
2. Teachers reported that the trainings have taught them how to use technology for teaching-learning and helped build their confidence, especially given the challenges posed by the pandemic. Teachers said they found the C-01 course itself very useful in this regard and appreciated the depth of exploration of tools. One teacher from Chhattisgarh said, “When I did my B.Ed., there was nothing about ICT in education. I got exposure to this here, through CLIx and have started

exploring and learning. I am trying and am now not scared of ICT."

3. Teachers in Chhattisgarh felt that the CLIx trainings and workshops could be improved by spending more time in offline interactions, creating their own contextualised digital TLMs and sharing it with peers. The teachers felt that during the RTICT course teachers should meet once a week and visit other schools to learn and conduct demo lessons. Their colleagues in schools who are not part of the course can also be brought in, so that collaboration can happen in the schools.
4. Teachers mentioned that they got to learn many useful features of tools that they had already heard of or tried to use before, such as Gmail or Google Forms. Teachers also found that the trainings helped them imagine new possibilities. For instance, teachers in Chhattisgarh said they have used Google Lens for their own learning, to translate a lot of content that is available in English into Hindi. One of the teachers said, "We are now learning apps on our own such as beaker app. (3d chemical mixing app for science)." Teachers seem to have developed the level of comfort with technology that is required to explore and work with tools that are part of and also beyond the curriculum of CLIx trainings and workshops.
5. Some teachers conveyed that the trainings have helped them deliberate on new teaching methods and strategies in their subjects. In the words of a mathematics teacher from Telangana, "When we go through these trainings, there is a spark in us, it makes us realize how these can be applied for teaching-learning". With respect to the tools they have learned to use, teachers gave the example of mind maps having made a big difference to students' grasping of concepts and reducing their need to resort to only rote learning. Teachers from Chhattisgarh who have been part of the RTICT course mentioned having received knowledge of how to support learning of children with special needs or learning difficulties through creation of videos and podcasts and use of screen readers for the visually challenged.
6. Chhattisgarh's teachers felt that the trainings also helped them to do reflective teaching and add meaningful activities to their interactions with students. They felt the discussion forum was very useful for sharing views and perspectives of teachers.
7. Encouraging peer interaction among students in the classroom, understanding how to give feedback effectively to students without discouraging them, understanding what seating arrangements are conducive to a learning environment, using ICT tools like GeoGebra to make concepts more meaningful were some takeaways that Telangana teachers mentioned they had from the trainings.
8. Teachers who attended the E-09 course online in Telangana said that the training was good and useful; they were confident in setting up the lab in their school and troubleshooting commonly encountered errors. They also highlighted that the training would have been better if the course

material had been given to teachers as hand-outs that they could refer back to later. Since they could only rely on notes they took during the sessions (if any), and network connectivity wasn't always reliable, there were parts they missed out or weren't very clear about.

9. Teachers who took part in the mathematics training on GeoGebra reported that it was interesting to see the ways in which the tool can be used for math teaching. However, since the training was online and focused more on theoretical aspects with little focus on practical hands-on practice, they weren't able to learn how to use the tool. They emphasized the need for more practical knowledge. One teacher from Telangana said, "Those teaching the course have their own laptops and mastery in using the tool but most teachers would be attending through a mobile phone with unreliable network connectivity. Even if we were to sit with a laptop, we won't be able to do it because there is no time given for hands-on practice. We need support with practical implementation only then it will be useful". This apprehension would also have implications for any cascade program for scaling up as these teachers do not seem to be ready yet.
10. Several teachers and HMs said that refresher trainings/repeat courses should be conducted regularly, or at the least, course material should be handed out to teachers to ensure that they are able to implement effectively. Without these, they felt, teachers tend to forget or lose motivation.

Communities of Practice Groups:

All teachers interviewed said that they are part of the CoP groups and that they have found it useful. However, some also reported that while the groups were active during the course/training, they are not so active currently. The last exchanges in some of the CoP groups were months ago. Teachers mentioned that photos of school roll-outs and implementation are shared occasionally on the groups which also motivates them to use the labs in their own schools.

In Telangana, about 75% of the teachers who responded to the survey said they participate/sometimes participate in the CoP group interactions and find them useful/sometimes useful while ~50% of teachers said they are not part of any CoP groups.

In Chhattisgarh, all the respondents said they participate/sometimes participate in the group interactions and find the shared resources useful/sometimes useful.

5.2 Adoption of technology and OER integration in education

Usage of ICT tools by teachers and Rps

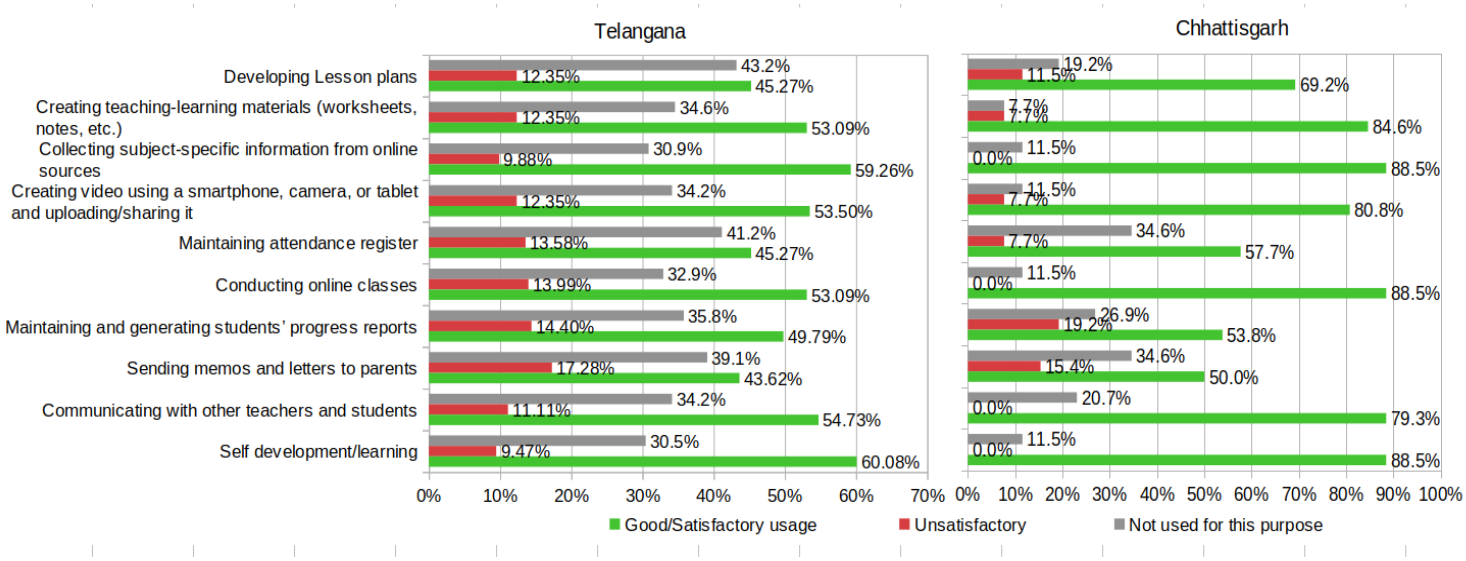

Figure 2: Respondents' perception of own knowledge/skill levels in usage of ICT tools

Online survey responses by teachers and RPs reveal that about 50% of respondents in Telangana have reported that they have been using ICT tools for the tasks listed in the figure and that their knowledge/skill level in using the ICT tools is *Good* or *Satisfactory*. Less than 20% of respondents have reported that their knowledge/skill levels are *Unsatisfactory* and about 35% of respondents on average have said that they have not used any ICT tools for the said purposes. In Chhattisgarh, about 80% of teachers and RPs have said that they have used ICT tools for creating TLMs, collecting subject-specific information from online sources, creating and sharing videos, conducting online classes, communicating with students and teachers, and for self development and learning. Between 10 and 20 % of respondent teachers have said that their knowledge/skill levels are *Unsatisfactory* in using ICT tools for developing lesson plans, maintaining and generating student progress reports and sending memos / letters to parents. About 19% of respondents have said that they have not used any ICT tools for the listed purposes.

CLIx modules and OERs

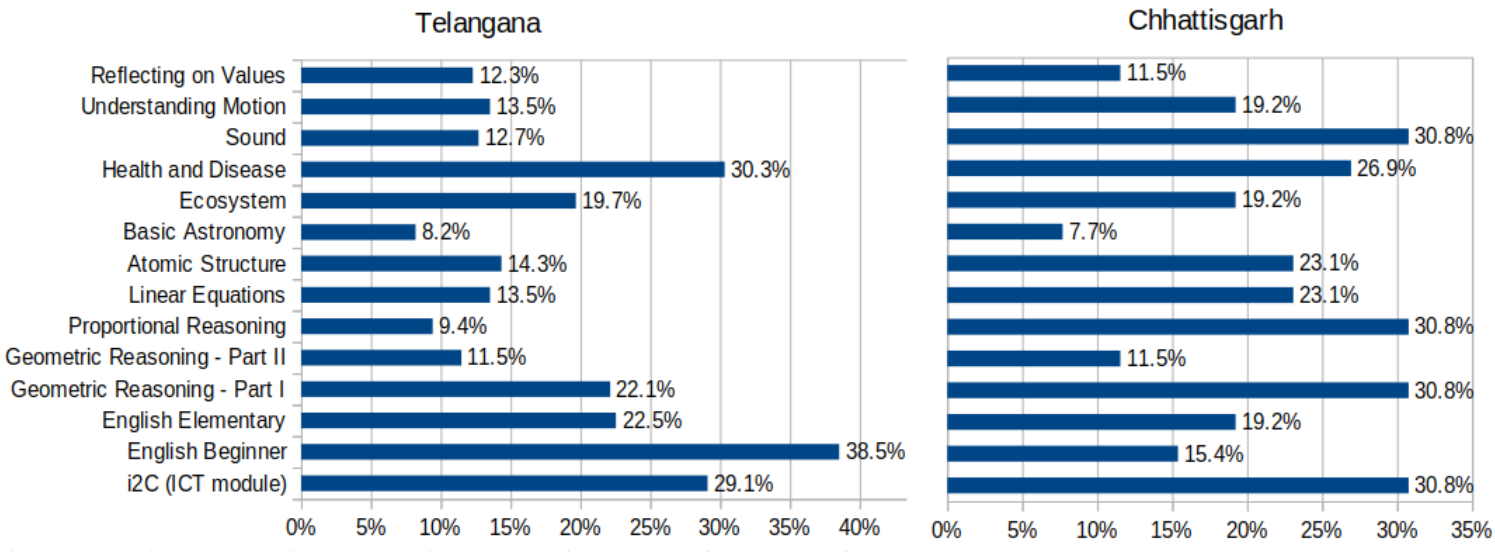

Figure 3: CLIx modules used by respondents for teaching-learning during the pandemic

* Percentages don't add up to 100 because respondents may have used multiple modules

As per the online survey of teachers and RPs, the Communicative English (Beginner), Health and Disease and i2C have been the most used CLIx modules in Telangana. In Chhattisgarh, Sound, Proportional Reasoning, Geometric Reasoning - 1 and the i2C modules have been among the most popularly used modules by respondent teachers and RPs. Other modules too have been used by many. Further insights from the FGDs and key informant interviews are discussed below:

1. Teachers reported that the CLIx modules are very well-designed as they are contextual and are enjoyed by the students. They said that the use of the modules have made children more responsive and active in the classroom. Teachers in Chhattisgarh mentioned that it would be very useful to extend the CLIx program to primary school students and teachers as well.
2. Some of the resource persons who were interviewed pointed out that the CLIx modules are very useful for teachers themselves. One respondent from Chhattisgarh mentioned having understood concepts even better and with more clarity because of CLIx modules than they did when they studied the same in their B.Ed. or M.Sc. programs.
3. Almost all the HMs interviewed in Telangana and some of the teachers in both Telangana and Chhattisgarh expressed that while the modules are useful, they are limited in number (only 2 – 3 per subject) and the content is not fully aligned with the new syllabus. They wanted more modules to be made available and in more subjects (Social Studies, Biology, Hindi, etc.)
4. Responding to the challenges they are facing in the use of the ICT labs, one of the teachers from

Telangana pointed out that the syllabus pressure that teachers are under and the limited number of curriculum-aligned CLIx modules is holding teachers back from insisting that students use the computer lab. Students are sent to the lab only when there are free periods and it is not being used actively by teachers for teaching-learning.

5. Some of the HMs also opined that there must be official communication/mandate from the department on the use of the ICT lab and the modules. They said that while some enterprising teachers are making use of the ICT labs and the modules, most others are not, since there is limited incentive perceived by teachers to use them.

ICT lab functionality and usage

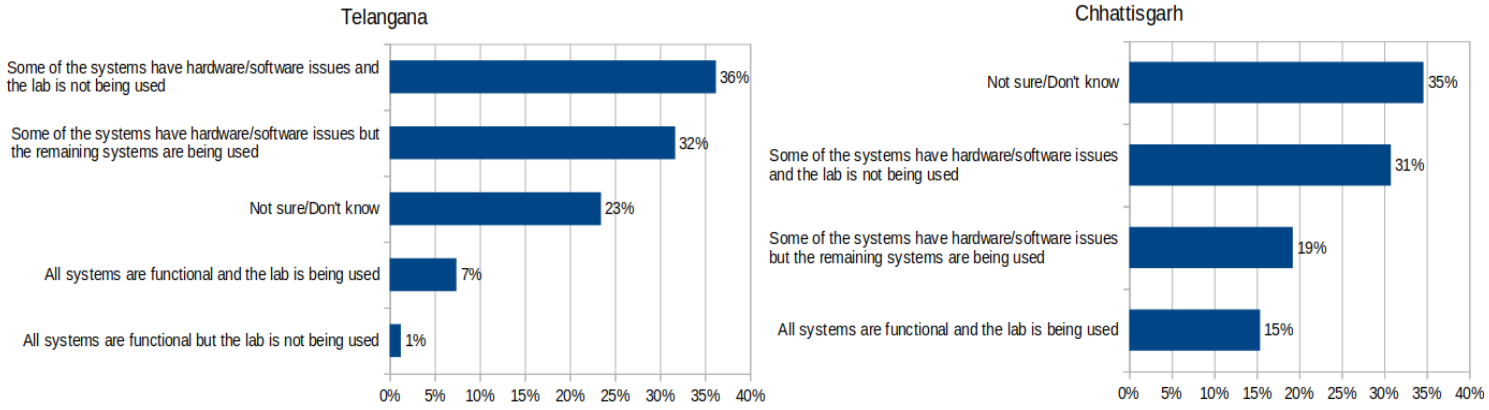

Figure 4: ICT lab functionality and usage

According to the online survey, 50% of teachers and RPs from Chhattisgarh and close to 70% from Telangana have reported that there are hardware/software issues in the ICT lab computers. Less than 10% of respondents in Telangana and less than 20% in Chhattisgarh have reported that all systems in their school ICT labs are functional and in use.

Integrating OERs/ICT in schools

CLIx is envisioned as a school-based ICT program and across the state of Telangana, as per conversations with different stakeholders, it is primarily only the CLIx schools that have ICT labs in place and other government schools don't really have computer lab set-ups. Having functional labs in schools is a crucial factor for the effective implementation of the CLIx program, as is allocating dedicated time in the school timetable for ICT related activities. The pandemic-induced school closures meant that the ICT labs which had been in use during CLIx Phase 1 could not be used or maintained for close to 2 years. As a result, a significant number of the lab components which are mostly old and hard to repair, now have technical issues and are not working. Chhattisgarh too faces similar issues in terms of technology infrastructure.

The government's plans to set up computer labs in 1200 schools has failed to materialize and teachers reported that their school computer labs have not been made functional. Indications of any plans for procurement of hardware for schools were not found in either state. In the current situation, where due to the pandemic the governments are seeing significant financial stress, it is highly unlikely that any large scale procurement of computers for school labs will be made. This significant and critical feature of the Phase 1 of the program is unlikely to be taken forward by the government. In a move to revive ICT labs and integrate them as part of the school timetable post reopening in September 2021, the Telangana education department issued a circular to reactivate ICT labs in the CLIx schools and allot ICT lab period in the school time table. This, together with the efforts of the CLIx team on the ground to revive as many labs as possible, has enabled the school labs to be reactivated in about half of the schools where CLIx was being implemented originally. However, overall the number of schools where CLIx is currently under implementation has gone down from 300 in phase 1 to 158 in phase 2. Although the circular specifies that ICT lab period must be allocated in the time table, stakeholders interviewed said that usage is subject to the teachers' interest and knowledge of the CLIx modules and currently, since many teachers are focused on the learning recovery of students, the labs are being used on a voluntary basis.

5.3 Partnership with key stakeholders

Relationship with State

In both Chhattisgarh and Telangana the project teams have an excellent rapport with the SCERT and Samagra Shiksha/Directorate of School Education at the state level. SCERT has a very good opinion of the program and equally importantly, of the team and its contributions over the last couple of years.

From the interviews with SCERT and District Education Department officials in both the states, it was evident that the department sees the CLIx team as a dependable ally for the integration of ICT in school education. The team was able to respond to the requirements of the department during the pandemic and supported the department in many ways. In Chhattisgarh, they participated in an EdTech campaign to provide orientation to thousands of teachers. They also responded to department needs in other ways as well. In Telangana, the department was appreciative of the proactive efforts that CLIx undertook at the onset of the pandemic to build the capacities of thousands of teachers and HMs to deal with the crisis through online trainings and courses. Several stakeholders reported that the CLIx trainings on using digital tools were of assistance to reach out to students and to ensure continuation of teaching-learning.

The setting up of the state and district monitoring committees, as explained in CLIx's concept note, is key to periodically monitor the progress and issue guidelines/instructions for effective implementation of the project. In Telangana, while there have been multiple discussions and an in-principle agreement with the

state on the setting up of state and district level EdTech steering committees, it has not materialized thus far. In Chattisgarh, 20 district committees have been formed and some have had 2-3 meetings.

Support network for RPs

The CLIx field teams have an exceptional relationship with the RPs and teachers and this came through clearly in the interactions had with respondents. The RPs conveyed that the CLIx team is highly dependable and can be reached out for help with lab issues, using ICT tools, etc. Teachers were copious in their praise for the support from the local teams in both Chhattisgarh and in Telangana. Not only were they clear that support was available, but they emphasized that support was available whenever it was required, without any consideration by the CLIx team of their own convenience or comfort. The support team was proactive in engaging with the teachers and making sure that their needs were satisfied as and when they arose. This goodwill that the CLIx team maintains with the teachers and schools also contributes to the successful implementation in schools.

In Chhattisgarh, teachers who were interviewed compared the RTICT course to other MOOCs they have been a part of which were not rigorous like the RTICT course. They also pointed out that nowhere else have they found the option to reach out to faculty and find them to be so approachable and supportive. One teacher mentioned, “I was unaware of digital things. I needed to chase the school computer teacher when I had to work on computers. But now with regular support from the CLIx team, I am capable and can do it on my own.”

6. Discussion and Recommendations

Some key aspects and enabling factors that have contributed to taking the program forward include the high goodwill that the CLIx project and the team have earned in both states for their work. The strong and committed work of the implementation teams in both Telangana and Chhattisgarh, and the stakeholders’ belief in them, was apparent from our interactions as a part of this evaluation. Participants reported that the field team has been very helpful and that they could reach out to them for any support requests knowing that they would be addressed.

The CLIx program builds and enhances skills in teachers. It has developed a cadre of teachers who can navigate the digital world. With additional training and practical exposure, this resource pool may be able to expand the program and train more teachers to be equipped in a similar manner. Keeping the course registration voluntary as in Chhattisgarh ensured that teachers join out of their own self-interest and not out of compulsion. The implementation teams in both states have been proactively identifying training needs and reaching out to departments to conduct online trainings and workshops for CLIx and non-CLIx

school teachers and HMs during the pandemic. The documentation of the work done, activities planned, completed, and underway, data about school-wise ICT lab status, etc has been detailed.

There have also been some disabling factors and challenges such as the lack of availability of computers in schools and ICT infrastructure like connectivity (both local and with internet), inadequate availability of teachers who have the ability to conduct further teacher development programs to take it across the state, and technical expertise available at local levels to take care of the infrastructure. In Telangana, despite the efforts of the CLIx team and the teachers, only about 50% of the labs of phase 1 are functioning due to the long period of school closure during the pandemic. Given the antiquated nature of the hardware, these computers too are not likely to work long. In Chattisgarh, it seems that the procurement of computers for 1,200 schools across the state has been mired in some legal issues and in the 450 schools where the computers have been supplied, not all are being used.

In terms of teacher training in Chhattisgarh, at the time of evaluation (at the end of 2 years out of 3 years of the phase 2 program), 300 teachers have been certified in the RTICT course. A program for teachers certified in the RTICT program through some kind of supported cascade or similar model may need to be considered for the CLIx program to scale. In Chhattisgarh, computer teachers were there only in the outsourced program and in the absence of any “outsourced program”, teachers currently face a challenge in terms of ability or capacity at a school local level to provide technology support to ICT infrastructure.

There are two ways in which one can see the progress and status of the implementation of the CLIx program in Phase 2. The first perspective would be to compare the work done with what was possible and needed during the given period. From this perspective, it is clear the team has done extremely well in both Chhattisgarh and in Telangana. Most of the period studied as part of this evaluation was covered by the Covid pandemic. Schools were closed and this meant that there could be no work in the schools and teacher training workshops could not be held. There was also lesser interaction possible with the department. Yet the local teams have managed to keep the program active and teachers committed. The teachers have been supported to conduct online classes during the pandemic as well as resume working in the labs when schools opened. The enthusiasm of the teachers enrolled in the courses was clear.

However, if one were to look at the progress of the CLIx program from the perspective of achieving what was envisaged as the goals of the second phase, then it is clear, that while the CLIx program should be continued, it will require to be significantly enhanced with much higher investment into the program to achieve success. Such investment, in our view, is an even bigger imperative in the post-pandemic context.

6.1 Recommendations for the Trust

The pandemic has given an enormous fillip to EdTech. However, the increased emphasis on ICT in education is driving governments to partner with for-profit EdTech firms for purchasing and distributing devices to students and delivering pre-packaged content. For instance, the Maharashtra and Andhra Pradesh governments have recently announced MOU's with BYJU'S to distribute its content to students through tablet. Huge amounts would be spent on procurement of student devices.

However, this design has been criticized on pedagogical grounds. It will deskill teaching and hollow out the public system, through depending for curricular resources and pedagogies on commercial vendors. Students are unlikely to benefit from direct access to devices, without active teacher mediation. The CLIx program has demonstrated a model whose fundamental approaches and strategies are quite the opposite; they hinge on teacher development and support, interactive and collaborative learning pedagogies, promote open educational resources, and partnership with state to empower public education system.

In order for the CLIx model - its principles, processes and products - to sustain independently in the system, continued and significantly enhanced investment into the program is necessary. The credibility that the program and the trust hold with the department should be consciously leveraged to influence the right decisions. This needs to be done through interactions at senior levels within TISS/TATA Trusts and the hierarchy-conscious state governments.

The education departments in both states need to be strongly persuaded for using their limited budgets for communal ICT infrastructure (school labs), instead of individual devices, and extend to make it available in more schools and districts, and simultaneously focus on teacher development to integrate EdTech in a manner that supports progressive pedagogic reform.

In Telangana, the CM has recently said that education has been neglected in the past, but this year, education is going to get top priority. The Telangana Education department has recently announced a program to provide Flat Panels in all secondary schools, and teachers need to be suitably equipped to leverage this investment using, not only the CLIx program developed open educational resources, but also the participatory pedagogies for authentic learning, that the program has supported.

In Chhattisgarh, if the 2018 procurement of computers for schools can be salvaged, then that would provide computers for 1,200 schools which would be a significant part of the total schools in the state and could be a basis for expanding it across to other districts. At the very least, if a projector and a laptop or a desktop are made available in every school, then teachers demonstrating different applications and resources that they have already developed knowledge and understanding of could be possible, and that

could take forward the CLIx program. It would not be the same as having students work on computers, but it would keep the program active until the time that computer labs are available.
Such a program needs to be planned which covers teachers in all the districts in both states so that they are then able to support their peers at a district or taluka level through professional communities of practice and take the program further even after the CLIx team withdraws. This would warrant a discussion with the department to persuade them to include this program as part of the 2022-23 and 2023-24 teacher professional development programs.

Basically our view is that state governments need guidance to take the right decisions on EdTech, in which direction, many are inclined towards, both due to the pandemic impact and the NEP's recommendations. This guidance needs to be provided through consultations at senior levels to get the understanding and buy-in of the state governments. This is essential to support the efforts from the implementation teams and enable the program to be scaled up across these two and other states.

6.2 Recommendations for the Government

While an important aim of education is to enable students to become self-directed learners, in our current school system, these abilities are not adequately developed due to several reasons. The teacher has a critical role to facilitate learning and support abilities for self-learning over time. Hence, providing digital devices to students, with software and content, expecting that students will learn by themselves, is highly likely to result in programmatic failure. Thus programs aimed at integrating technology in education should not bypass teachers, but should instead, build the capacities of teachers to interpret and appropriate technology themselves and enable them to use it in teaching-learning as they see fit in their respective contexts.

The CLIx program has built such capacities in teachers, emphasizing the importance of collaboration, OERs, and learners' active participation and interaction in the learning process. This program strengthens the capacities of the public education system, instead of making it dependent on vendors, and is a model that needs to be explored.

6.3 Recommendations for the CLIx Implementation Team

1. The trainings and workshops done in online mode due to the pandemic had a few limitations viz, teachers not being able to attend and follow thoroughly due to network constraints, limitations of less or no practical and hands-on experience, unavailability of reference material, among others. If periodic face-to-face training programs and workshops for teachers and resource persons could now be held including hands-on sessions on installing, configuring and using applications, they

would certainly support continued engagement and implementation. A blended model may be considered instead of purely online courses, as physical interactions can help in the building of both understanding and skills through deeper interactions between faculty and teachers and amongst teachers.

2. An adequate number of teachers who have been trained through the courses and workshops need to be confident in adapting ICT for their subject teaching as well as for creating resources. Therefore, yearly refresher courses and supplementary training programs for all stakeholders across the state would be essential to ensuring that the knowledge and capacities built over time through the CLIx program are sustained within the system. The availability of ICT infrastructure in the schools is an essential challenge to be addressed. CLIx has been visualized as a school based program, but the probability of large scale procurement of computers by the government for schools may be low now, due to post pandemic funding squeeze in government budgets.

3. The fact that teachers and HMs were requesting the CLIx team to increase the number of modules provided to include more subjects and topics can be considered an indication of their perception of CLIx as a product/service provider and themselves as users. While the implementation of CLIx modules were intended to serve as a context for the integration of ICT in teaching-learning, the larger objectives are to improve teacher education and student learning through the use of ICT-enabled Open Education Resources (OER). This requires the principles behind the need and importance of OERs to be imbibed in teachers, and their pedagogical imagination for ICT integration in education to span beyond the usage of CLIx provided modules, to include the creation and curation of OERs by teachers, and the exchange of ideas with their communities of practice on effective strategies for the usage of those OERs. This could be considered in the future implementation of the project.

4. The Communities of Practice groups can be an invaluable network for teachers and other stakeholders if further enhanced as intended to discuss questions, ideas, opinions, reflections, etc. relevant to their practice and improve implementation strategies.

Annexe

Evaluation Tools

General questions for all teachers and RPs (online survey)

1. What is your full name?
2. Which State do you belong to?
3. Which district do you belong to
4. Which school do you teach in?
5. Which classes do you teach?
6. What is the average number of students across all the classes you teach?
7. Which subjects do you teach?
8. Which is most applicable for the ICT lab in your school?
    a) Some of the systems have hardware/software issues and the lab is not used by teachers and students
    b) Some of the systems have hardware/software issues but the remaining systems are used by teachers and students
    c) All systems are functional but the lab is not used by teachers and students
    d) All systems are functional and the lab is used by teachers and students
9. Is the ICT lab being maintained under the CLIx program?
    a) Yes
    b) No
    c) Not sure
10. Select the option that applies for each statement.
    Yes, I think so / Maybe, I am not sure / I don't think so
    a) I am comfortable using desktop/PCs/laptop
    b) ICT can be useful for my own learning
    c) It is important for students to have a dedicated ICT lab period in the time-table
    d) ICT can be used for teaching students
    e) ICT can be useful for making TLMs
11. How often do you use the ICT lab for teaching-learning?
    a) Not at all
    b) Once a month
    c) Once in 2 weeks
    d) Atleast once a week
    e) More than once in a week
12. Are you familiar with CLIx modules and OERs? (Yes I am comfortable navigating/ Somewhat familiar/not heard)
13. Which of the following OERs have you used for teaching-learning during the pandemic?
    a) CLIx modules(eg - communicative english, understanding motion, grometric reasoning, etc)
    b) GeoGebra files
    c) PhET simulations
    d) Storyweaver stories
    e) Scratch

f) Resources from arvindguptatoys.com
g) Other

14. Did you reach out to students during the pandemic via WhatsApp/phone?
    a) No, I could not
    b) Yes I could contact some of them
    c) Yes, I could contact most of them
15. What kind of resources did you share with students?
    a) Worksheets
    b) Recorded videos
    c) Youtube video links
    d) Images
    e) PDF files of notes, textbook content
    f) Other
16. What kind of activities did you assign for the students to try?
    a) Sent notes related to their lessons to be copied in their notebooks
    b) Sent worksheets to be solved and shared back with me
    c) Assigned tasks which involved some hands-on activities
    d) Sent questions to be answered based on a video/reading/task
    e) Other
17. How useful do you think the resources and activities were for the students?
    a) Useful
    b) Not very useful
    c) Somewhat useful
18. Which training program/course have you been a part of?
    a) i2C/C01 - Introduction to ICT and Education
    b) CLIx OER and navigation
    c) E09 Lab Readiness course
    d) RTICT
    e) RP training - subject specific
    f) Refresher RP training
    g) School leadership for school developement(SLSD) course for HMs
    h) General ICT training
    i) Subject specific ICT training
    j) Other
19. After attending the trainings which new apps/tools have you started using?
    a) CLIx modules and OERs
    b) BigBlueButton
    c) Google meet
    d) Google docs
    e) Google sheets
    f) Google slides
    g) GeoGebra
    h) PhET
    i) Storyweaver

j) Scratch
k) Arvindguptatoys
l) Mindmap
m) Metastudio
n) Inkscape
o) LibreOffice writer
p) LibreOffice Calc(spreadsheet)
q) LibreOffice Impress(presentations)
r) Other

20. Have you been using ICT for any of the following tasks? How would you rate your skill / knowledge level?
    a) Developing Lesson plans
    b) Creating learning materials (worksheets, notes, etc.)
    c) Collecting subject-specific information from online sources
    d) Creating video using a smartphone, camera, or tablet and uploading/sharing it
    e) Maintaining attendance register
    f) Marking Attendance
    g) Conducting online classes
    h) Providing assignments/homework to students
    i) Assessing Students' homework/assignment
    j) Generating students' progress reports
    k) Sending memos and letters to parents
    l) Communicating with other teachers and students
    m) Self development/learning
21. CoP -
    a) Do you read the messages?
    b) Do you find it useful?
    c) Do you participate?
22. On a scale of 1 to 10 how useful did you find the training?
23. Mention at least 2 major learnings/skills you picked up from the trainings? Were you able to apply them in your teaching process?

Teachers/RPs (Interview/FGD)

1. Have you taken the online survey?
2. Which CLIx training programs have you attended?
3. What has been your most significant takeaway/learning from the CLIx training program?
4. Are you familiar with CLIx modules? Have you used any as part of your teaching?
5. Any particular modules that you have found to be useful?
6. Do you now feel more confident to use ICT as part of teaching-learning?
7. Have you tried any new teaching strategies in your classroom that were covered in any of the CLIx trainings?
8. What were some useful learnings/takeaways from the training?
9. How do you think the use of ICT in teaching-learning helps students?
10. Did you conduct online classes during the pandemic school closure period? How was your

experience?

11. What are some challenges you face in using ICT for teaching-learning?
12. Is there anything that you think could have been better/modified in the trainings (with respect to content, pace, etc.)?
13. Do you find the CoP groups to be useful? In what ways? (WA/Telegram)
14. How much do you think the program has made the school independent?
15. What challenges/problems has the CLIx training solved for you? What difference has it made for you?
16. Have you taken students to the ICT lab and used the CLIx modules after schools reopened?
17. In what ways did the training help you understand your subject and make adjustments to your pedagogy?
    TPCK - are you able to make your own material? content
    RPs only:
18. What has been your most significant takeaway/learning from the CLIx training program?
19. Have you conducted any trainings for the teachers in your district?
20. If yes, what all did the training cover?
21. What do you think is your role as a resource person?
22. Have you faced any challenges in conducting training sessions for other teachers?
23. Do you feel comfortable reaching out to the CLIx team for any support? Can you share any instances where you had reached out for support?
24. Did the CLIx trainings cover aspects related to how training sessions are to be planned and conducted?
25. Did the CLIx trainings cover aspects related to anticipating and dealing with challenges?
26. As a resource person, what kind of support should you offer to teachers?
27. Did you observe any differences between the CLIx trainings and any other trainings that you have attended/conducted?
    what is unique about CLIx training vis-a-vis other department trainings?

School Heads/ HM (Interview/FGD)

1. Have you attended any of the CLIx programs apart from the SLSD training?
2. What has been your most significant takeaway/learning from the CLIx training program?
3. In your role as a HM, what are some of the most challenging tasks you face? (to examine if tech can aid in simplifying any of them) Do you think any of them may be simplified with use of technology?
4. In your opinion, what are the technology integration possibilities in your school? For what purposes can tech tools be used in a school?
5. Do you currently use technology tools for school operations management or as part of the TL process?
6. If yes, which tools do you use and for what specific purpose?
7. Since when have you been using these tools?
8. Did the SLSD training introduce you to any new tools that you have now started using?
9. Does your school have a functional ICT lab? Is it in use?
10. What is your opinion on the use of ICT for teaching-learning?
11. What according to you are some challenges in using ICT for teaching-learning?

12. Do you think it is important for students to have a dedicated ICT lab period in the time-table? Why?
13. Is there dedicated time allotted for ICT in the time table in your school?
14. Has the CLIx program addressed any challenges/problems in your school? If yes, what have these been? What difference has it made for you and the school
15. Do you think ICT capabilities of teachers who attended the CLIx program have improved ? How can you say?
16. What has been the response of teachers who attended CLIx training during the pandemic period? Have they given any feedback?
17. Do you think any aspect of the CLIx program needs to be modified/changed to improve effectiveness?
18. Has there been any change/ impact on the teachers' teaching strategies?

E09/C01 course (Interview/FGD)

1. Do you think it is important for teachers to be aware of setting up and maintenance of an ICT lab in a school? Why?
2. What aspects were covered as part of the E09 course?
3. Since the program was online, did you get a chance to install/set up the lab at all?
4. Do you find the CoP groups to be useful? In what ways? (WA/Telegram)
5. Did you find the training useful?
6. What were your main learnings from the course?
7. Have you faced any challenges in setting up/configuring/maintaining the ICT lab in your school(after reopening)
8. What are some commonly faced hardware and software issues in the lab?
9. Do you feel confident that you will be able to troubleshoot any hardware related issues that may arise in the ICT lab?
10. Do you feel confident that you will be able to troubleshoot any software related issues that may arise in the ICT lab?
11. Do you reach out to the CLIx team for any help? Do you get the needed support?
12. Do you have any feedback/suggestions for improvement of the course or CLIx team engagement?

Dist., Sub dist. Officials (Interview/FGD)

1. For what purposes do you think tech tools can be used in schools in your district/mandal/block?
2. What possible benefits and challenges do you see with ICT use in a school setting?
3. What is your opinion about the CLIx program? How has it been able to contribute to the integration of ICT as part of the state's education system?
4. What are some challenges at the systemic level in integrating ICT in schools?
5. Do you think ICT capabilities of teachers, school heads, and students have improved in districts where CLIx program is running? How can you say?
6. What has been the response of teachers, HMs in your district for the trainings conducted by CLIx during the pandemic period? Have they given any feedback?
7. Do you think any aspect of the CLIx program needs to be modified/changed to improve effectiveness?
8. Is there any formal/informal feedback process from Dept. to CLIx?

9. In what ways do you think teachers can use ICT as part of teaching-learning?
10. In what ways can school leaders and administrators use ICT for operations management?
11. How often does the department hold meetings with the CLIx team?
12. Do teachers raise support requests with respect to the program?
13. What do you think ICT integration in education should look like in your district/state in the next 3 to 5 years?

State/District Steering committee (Interview/FGD)

1. How often does the steering committee meet?
2. Are these meetings documented and action items identified?
3. How often are the visits from SCERT to program sites?
4. For what purposes do you think tech tools can be used in schools?
5. What is your opinion about the CLIx program? How has it been able to contribute to the integration of ICT as part of the state's education system?
6. What are some challenges at the systemic level in integrating ICT in schools?
7. Is there any formal/informal feedback process from Dept. to CLIx?
8. Are there plans to extend the CLIx program to more schools in the current districts or to more districts? What steps are being taken in this regard?
9. Currently, what percentage of the ICT infrastructure is maintained and functional in the CLIx schools?
10. In the departments own programs is CLIx mentioned/considered?
11. What do you think makes the CLIx model for ICT integration unique? Is it a sustainable approach? If yes, why do you think so?
12. Do you think ICT capabilities of teachers, school heads, and students have improved in districts where CLIx program is running? How can you say?
13. What has been the response of teachers, HMs in your district for the trainings conducted by CLIx during the pandemic period? Have they given any feedback?
14. Do you think any aspect of the CLIx program needs to be modified/changed to improve effectiveness?
15. What do you think ICT integration in education should look like in your district/state in the next 3 to 5 years?

Students (Interview/FGD)

1. Did teachers reach out to you during the pandemic?
2. Did you have online classes during the lockdown?
3. Were you able to understand what was taught during online classes?
4. Were any resources shared with you by teachers during the school closure period?
5. Were the resources shared useful for understanding concepts/topics?
6. Did you try out any learning activities while schools were shut? If so, what?
7. Have you used the ICT lab in your school?
8. If yes, what have you explored on the system? What do you find interesting?
   For students who attended Scratch/GeoGebra sessions:
9. Are you familiar with Scratch/GeoGebra application?

10. What was interesting about the application?
11. What did you learn in the sessions?
12. Did it help you understand any concept/topic better?
13. Have you explored the application further beyond the session?