

# Social Impact Assessment Report

## IT for Change, Bangalore

*(Funded by Cognizant Foundation)*

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**Scope: may 2018 to April 2021**

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## Acronyms

ITfC – IT for Change
CF – Cognizant Foundation
TCOL – Teachers Community of Learning
DSERT – Department of State Educational Research and Training
DIET – District Institute of Education and Training
RMSA - Rashtriya Madhyamik Shiksha Abhiyan
BEO – Block Education Officer
IVRS – Interactive Voice Response System

## 1. Background

Digital literacy is considered one of the important tools to realize the goals of the National Education Curriculum. The teacher's role and capacity to use these tools plays a significant role in actualizing these goals. The National Education Policy notes that one of the central principles steering the education system will be the 'extensive use of technology in teaching and learning, removing language barriers, increasing access as well as education planning and management'. The Policy envisages the development of digital infrastructure, digital content and capacity building to meet the e-education needs of both school and higher education. This aspect of the policy has gained more significance during the last two COVID affected years, which has forced a re-think on accessibility of education.

### IT for Change

IT for Change (ITfC), an NGO located in Bangalore, promotes innovative and effective use of ICT to bring about socio-economic transformation, especially in marginalized communities. ITfC has been taking the lead in implementing the ICT policy with a focus on collaborative and participatory processes of learning in government and aided schools

IT for Change aims to strengthen the public education system by capacity building and training teachers to integrate digital tools in their classroom teaching. ITfC also engages with the mainstream education system at the state and central level to advocate on policy and program aspects.

### Cognizant Foundation

Cognizant Foundation (CF) was established with the objective of improving, guiding, and inspiring the lives of underprivileged people and focuses primarily on the areas of education, healthcare, and livelihood. Cognizant Foundation has been supporting ITfC for more than five years, particularly the Teacher Community of Learning (TCOL) program in government and government-aided schools.

The TCOL program, which was implemented in government schools, was extended to government-aided schools from 2018. **CF has extended financial support to ITfC for implementation of the project impacting government-aided schools for three years, from May 2018 to May 2021.**

Due to the pandemic and the abrupt closure of the schools, the TCOL program had to be re-oriented to meet the needs of the teachers and students. The program veered towards facilitating online teaching for the teachers and conducting supplementary classes for students in various subjects.

## 2. Objective of the study

This study aims to examine and understand the extent to which the stated objectives for the Teachers Community of Learning (TCOL) for the aided schools, have been met during the period May 2018 to May 2021.

Ms. Vatsala Ravi Krishnan and Ms. Aruna Subramaniam, Social Auditors of SAN India, conducted the impact assessment study. They were ably guided by Ms. Marie Banu and Ms. Latha Suresh, Social Auditors from Chennai.

The report documents the overall impact of ITfC’s program for aided schools in Bengaluru South 3 Block, on teachers and students and the documentation and advocacy efforts of the organization in the larger education space.

The grant released by Cognizant for this program was Rs. 73,31,164 for the period 2018 to 2022.

Table 1 - Grant Summary

Sl. no	Date	Amount
1	17-May-2018	1,224,450
2	19-Jan-2019	1,224,450
3	26-Aug-2019	1,236,895
4	14-Jan-2020	1,236,895
5	08-Jun-2020	1,360,530
6	22-Jan-2021	1,047,944
	<b>Total</b>	<b>7,331,164</b>

The overall purpose of the grant was to address ICT needs of stakeholders - at the student level, teacher level and school level by

1. Supporting schools and teachers to learn and adopt ICT for their own development and their teaching learning processes
2. Facilitating linkage of aided school teachers through block and state-wide forums for learning and sharing of resources
3. Designing and developing new pedagogies in Science, Mathematics and Kannada, based on the national ICT curriculum in select schools using the available free software resources
4. Developing modules for school leadership and administration, including a focus on using technologies for school management
5. Orientation for schools, teachers and parents on inclusive education approaches to facilitate early detection of learning delays and exploring technology-mediated solutions

### 3. Methodology

- Study of ITfC’s record-keeping / Management Information System
- Online questionnaires to teachers and students of government aided schools
- Structured and semi-structured interviews with the school administrators, teachers and students
- One-to-one interviews with the program managers
- Review and analysis of secondary data provided by ITfC, which includes information from the website and papers published

## 4. Scope of the study

The scope of the study is from May 2018 to April 2021. The geographical location is South Block 3, Bangalore, which originally included 30 aided schools, according to the MoU signed between ITfC and Cognizant Foundation. Due to the pandemic and change in the design the scope of the programme was altered to 42 schools, including both online and offline delivery.

## 5. Stakeholders consulted

Stakeholders	Total Nos.	Nos. consulted	Mode of consultation	% Consulted
Teachers*	386	37	Survey	15%
		20	FGD	
Head Masters*	37	3	Interview	8%
Students and Alumni**	4004	119	Survey	3.2%
		11	FGD	
Programme Managers	5	3	Interview	60%

\* This includes Teachers and Headmasters who were part of the government and government-aided schools in the TCOL programme

\*\*Students in schools where direct intervention was done

## 6. Report on Performance

### Teachers' Community of Learning

IT for Change's Teachers' Community of Learning program is anchored in the ideas of teacher agency and school autonomy in public education systems. It is their belief that facilitating access to digital resources and peer networks for teachers is vital to make basic classroom practices democratic and participatory.

The three main objectives of the TCoL program are

1. Extending the program of technology integration among the student and teaching community at the block and school level
2. Supporting the community of aided school teachers through developing resource modules for new textbooks and publishing on Karnataka Open Educational Resources (KOER) portal.
3. Using the learnings and resources to advocate for systemic and policy changes to make education truly inclusive and participative.

During the assessment period, ITfC offered the TCOL program to the teachers of government aided schools in Bangalore South 3 Block. These schools are run by charitable trusts and mostly cater to children from lower socio-economic backgrounds.

The teacher support was done through block level teacher capacity building workshops and through demonstration classes and collaboration with the teachers to develop lesson plans and resources for their use and for sharing online with the teacher community

### Intervention at the Block Level

In order to facilitate the induction of teachers into the TCOL program and integrate the ICT program into the mainstream curriculum, ITfC has worked closely with the Education Department, which includes Department of State Educational Research and Training (DSERT), District Institute of Education and Training (DIET) and Block Resource Coordinators of the Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and Block Education Officers (BEO).

During the assessment period, 27 block level TCOL training programs were conducted primarily for Mathematics and Language teachers. A total of 386 teachers, including HMs, from government-aided schools have attended the workshops in the last three years.

Table 2–Details of Block level trainings

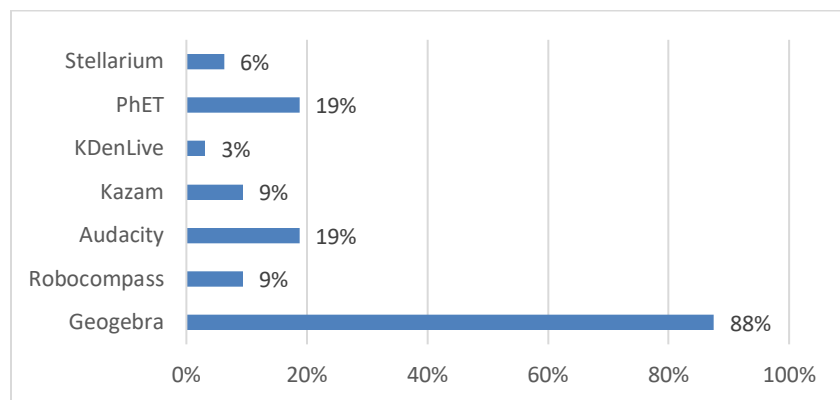
Period	No. of Block-level Workshops	No. of workshops in Kannada and Mathematics conducted at school level
2018 - 2019	10	23
2019 - 2020	8	47
2020 - 2021	9	42
<b>Total</b>	<b>27</b>	<b>112</b>

The training curriculum included knowledge of basic computer operations, and familiarization with various free education resources and digital tools available for use in the classroom. Some common tools made available for Mathematics, Language and Science teaching were:

- a) Geogebra
- b) Robocompass
- c) Audacity
- d) Kazam
- e) KDenLive
- f) PhET

The teachers who attended the training were encouraged to create their own resources and share with their peer group. They were further connected to subject-based WhatsApp groups for continuous engagement and exchange of resources. ITfC gathered the resources through informal interactions and more than 60 teachers have demonstrated using ICT in their regular classes.

Figure 1 - Tools used in the classroom



### Workshops on School Leadership and Development for Headmasters/Headmistresses

To develop school leadership and efficient administration, 3 Block-level training for 37 Headmasters/Headmistresses were conducted to exchange ideas, to resolve challenges in running the school, with inputs on how to use technology to improve efficiency. Components of the program included introduction to Ubuntu and Firefox and facilitation for creating a personal digital library with a compilation of useful web resources.

Basic mobile apps like Telegram and Moodle were introduced and installed. The HMs were encouraged to use Ubuntu to maintain the school MIS and IVRS (interactive voice response system) for communicating with parents.

#### Poetry teaching in a new format

Teachers often find it challenging to keep the interest of students on topics which are subjective and narrative in nature. Besides the basic text book, other teaching aids are difficult to access in a typical classroom setting. After being introduced to ITfC and their intervention on language teaching using ICT tools, one of the teachers at Hombegowda Boys High school had this experience to share.

*“Hallagalli Bedaru is a historical poem, based on the Sepoy Mutiny. It talks about how a hunter tribesman tried to fight the injustice meted out to them by the British. To make the class interesting, the poem was taught with the aid of an entire audio-visual presentation of the historical context. The students were able to grasp the nuances of the poem and also internalize the theme better. This was reflected in their written performance.”*



**Interventions at the school level**

To ensure that the integration of ICT would take place at ground level, ITfC works with selected individual schools. Schools are selected through a need assessment process and the buy-in of the school management. During the assessment period, ITfC reached out to 27 government-aided schools and a few were selected

Table 3- Details of School level intervention

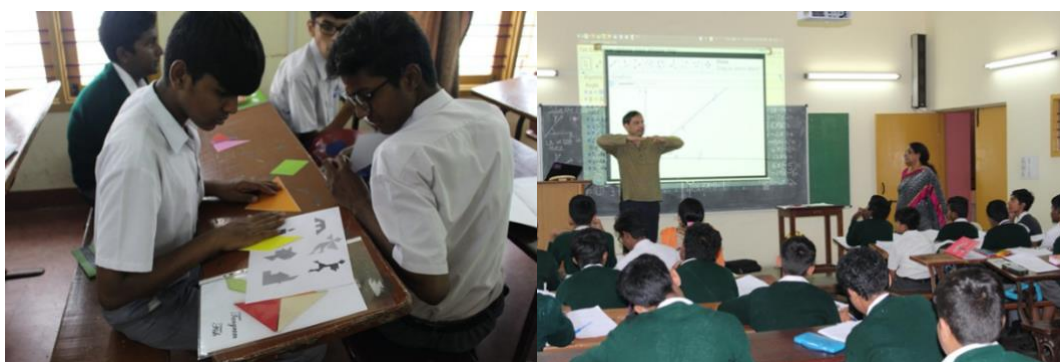
S.No	Schools name	2018-19		2019-20		2020-21		
		Class 8	Class 9	Class 8	Class 9	Class 8	Class 9	Class 10
1	Bengaluru High School (BHS), Jayanagar 4th Block	60	65	60	60	-	-	-
2	Gangamma Hombegowda Girl's High School (GHGHS) Hombegowda Nagara	45	40	40	45	45	40	40
3	RS madiwala High schools, Madiwala			30	30	28	30	28
4	Hombegowda Boys High School (HGBHS), Hombegowda Nagara	105	90	100	105	105	90	100
5	Kamala Nehru Boy's High School, Yadiyuru			-	80	80	-	-
6	MES High School, Jayanagara	40	38	45	40	70	55	35
7	St Euphrasias High School, Richmond Town	150	150	145	150	145	150	150
8	Government High School, Jayanagara 9 <sup>th</sup> block	-	-	35				
9	St Teresa High School Begur	-	-	50				
10	Our Lady of Bon Secours Girls High School, Victoria Layout	-	-	-	-	200	200	150
11	Government High School, Yedyuru	-	-	40	40	35	40	-
12	Government High School, Adugoddi	-	-	45		40	35	-
13	Jnadegula High school	-	-	40	40	35	40	35
	Total number of students per class	400	383	630	590	783	680	538
	<b>Total number of students</b>	<b>783</b>		<b>1220</b>		<b>2001</b>		

The interventions at the school level were multifold:

**a) Collaboration to develop lesson plans and activities with the teacher**

ITfC program managers worked in close collaboration with the school teachers to develop practical methodologies to integrate ICT into the lesson plans. This included poster presentations, video demonstrations, use of software, etc. The topics covered were synchronized with the school syllabus. A number of lessons developed by the teachers have been uploaded on the KOER.

**b) Demonstration and execution of Mathematics and Kannada ICT activities in the class as proof of concept for digital learning**



*Math and data analysis workshops in progress*

Resource persons from ITfC held special demonstration sessions using digital resources in selected schools in Mathematics and Kannada subjects. This helped the students and teachers get acquainted with ICT tools. Schools assigned regular classes in their calendars for these sessions. Working within the context of the classroom also helped ITfC understand the needs and refine the resource materials.

For teaching Kannada, digital resources were helpful to create a rich contextual experience for the students within the classroom. Students worked on picture stories to support their language learning and also worked on building their creative writing skills by creating a school newsletter.

*“ITfC believes in bringing technology and pedagogy together. Experiential learning visits to local institutions like banks, post offices, hotels and retail outlets helped students to collect data such as services and price points. The data collected was analysed using LibreOffice, and pie charts and bar charts were made and presented as a project. This experience helped students to gain first-hand knowledge about services and the value of the products in the market as well as use software tools to study and analyse the data as prescribed in their curriculum.”*

***–Mr. Gurumurthy Kasinathan, Director ICT and Education***

**c) Enabling the school with computer labs**

During the assessment period, a total of 535 de-bonded computers donated by Cognizant Foundation have been distributed among 27 schools, including 17 aided schools, 4 education depts and two B.Ed Colleges. ITfC has set up computer labs and upgraded existing systems in selected government-aided schools.

The computer teachers in each of these schools were trained to use free software and maintain the lab. Regular lab classes have been scheduled for the students to get hands-on experience in using the digital tools.



*(Teacher capacity building at St Euphrasias Girls high school in the their newly inaugurated lab with computers donated by CF)*

**d) Digifest**

Digifest is an inter-school competition for students to demonstrate the digital learning and skills they have acquired in the school throughout the year. It is a forum to exhibit and share student creativity. This event is an opportunity for students to showcase their work and share their learning about these tools among fellow students from other schools.

Students from government and government-aided schools participated in the first Digifest event. They explored the use of Geogebra (Maths), Freeplane (for building concept maps), PhET (science simulations) H5P (Interactive assessments), Indic Anagram (vocabulary building), TuxPaint (for creating illustrations), Audacity (for language learning) and Turtle Blocks (programming), besides learning basic office applications like text editor and spreadsheet. They produced audio stories, photo essays, Geogebra lessons, and other forms of digital storytelling. Participating in quizzes and making presentations help to build the confidence of the students.

The second Digifest in February 2020 saw the participation of around 100 students from 8 schools.

Table 3–List of Schools and Presentation tools used for Digifest

Sl. NO	School	Tool	Artifact
1	St. Euphrasias Girls High School (EGHS)	Geogebra Turtle Art	Geogebra lessons/ sketches Visual programs
2	BHS High School (BHS)	Tux Paint  Mobile phone recorder	Picture story Audio story
3	Gangamma Hombe Gowda Girls High School (GHGHS)	Mobile phone recorder Audacity	Audio story
4	Kamala Nehru Boys High School (KNBHS)	Mobile phone recorder Tux Paint	Audio story Picture story
5	Domlur Government High School Mobile phone recorder	Audacity	Audio story Geogebra lesson/ sketch
6	Jayanagar 9th Block	Geogebra	Geogebra lesson/ sketch



**e) Encouraging the management to integrate technology in their school administration systems**

The management of schools has started integrating digital tools for their school management and administration. ITfC has supported them in the use of Ubuntu. With the support from ITfC, many of the schools have introduced Interactive Voice Recognition System (IVRS) for school teachers to contact parents. During the pandemic, IVR messages, sent by ITfC on behalf of schools helped them reach out to parents who were not comfortable with emails or text messages.

The IVRS communication included details/preparation for SSLC examinations, asking students to participate in online classes and information about the “Doordarshan Chandana” classes. It was hoped that these messages would help parents become active participants in their children’s

learning. These messages were also used to inform teachers about online courses and students about the special online classes for classes 8, 9 and 10 conducted by ITfC during the pandemic.

### Activities during the Pandemic

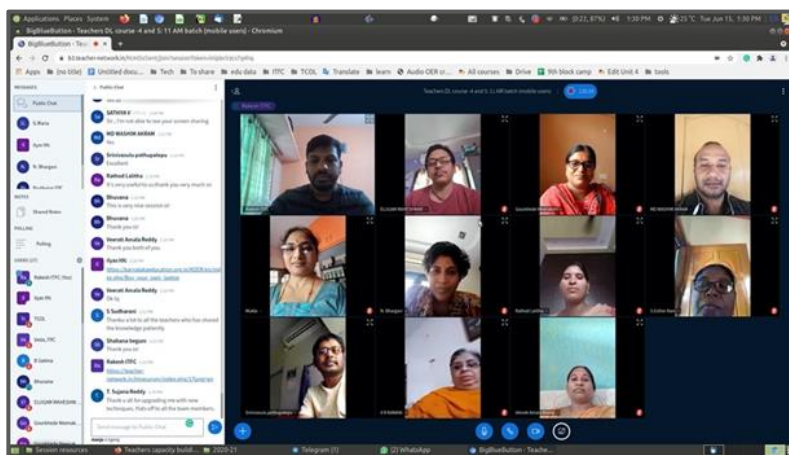
With the onset of the pandemic, schools were shut down for more than 20 months and the need for online classes became imperative. The education system and the teachers were struggling to continue with the academic programs.

ITfC, conducted Block level Digital Literacy workshops for teachers and, being a champion for FOSS, leveraged the opportunity to introduce Big Blue Button software, an open-source web conferencing system designed for online learning. Teachers of all subjects were encouraged to attend the special training programs conducted on the usage of the software. The training helped in building the capacity of the teachers to conduct online classes, gave them access to Learning Management Systems, engagement tools, and analytics.

### Teachers Digital Literacy program

Students from lower socio-economic backgrounds typically have very limited access to digital gadgets. This became a constraint for learning during regular school hours. Many students could not attend the online classes. Perceiving this need, ITfC conducted open online classes for 8th, 9th, and 10th class students during the evening hours on all subjects. This was attended by students studying in 13 schools.

As may be imagined, teachers all over were facing challenges professionally and personally. A unique activity was designed by IT for Change to motivate the teachers. Mr. Gurumurthy conducted a book reading session with them, dealing with classroom teaching issues. Diva Swapna, written by Gijubhai Badheka was used as resource material to help teachers to think through issues and identify new techniques of teaching during these challenging times.





When the schools were re-opened briefly, ITfC conducted Back to School camps. The objective of the camps was to motivate and excite the children to get back into a structured learning environment. The camp included library activities (English and Kannada), picture storytelling, word categories, foundational mathematics, everyday science activity and solving puzzles.

The pandemic accentuated the learning gaps among children, particularly mathematics, which is a much-dreaded subject. The baseline test revealed that students were 2 to 3 grade levels below Class 9, except for a handful of students. To overcome the fear and strengthen the foundation among the students, ITfC organized its first-ever three-day Maths workshop. Math-related concepts in daily life were unearthed in fun activities.



### Online Teacher Training: No Effort Too Great

The COVID pandemic had put a sudden halt to activities in almost all walks of life. Like the rest of the world, quick and sudden decisions for closure of organizations were warranted. Schools too, being one of the vulnerable institutions, had to shut down. The indefiniteness of the re-opening propelled the teachers to take some affirmative actions to ensure that students do not go off the learning track.

IT for Change played a pivotal role in converting this into an opportunity to help teachers of **all subjects** get introduced to technology and ICT-based teaching and learning. A training on how to use the Big Blue Button software, an open-source web conferencing system was organized for the teachers. Most of the teachers had left for their hometowns. Since it was a virtual training program, the teachers agreed to attend and skill themselves with the tool from their respective homes. One Social Science teacher from MES School said:

*“I was staying in my hometown Sirsi, located in Uttara Kannada. The network in my area is very poor. I was informed about this program by my colleagues. I was very keen to attend this program. With the help of a Jio sim card installed in my phone, I had to track down places where I could get good continued network access. Finally, I found a place on a hillock and attended the training. The network kept fluctuating, yet the resource people understood my situation and provided support in completing the training. It took nearly 4-5 days for us to get full clarity on how to get started with the software. All our doubts were clarified patiently and we had access to reach them anytime. “*

## 7. Survey Findings

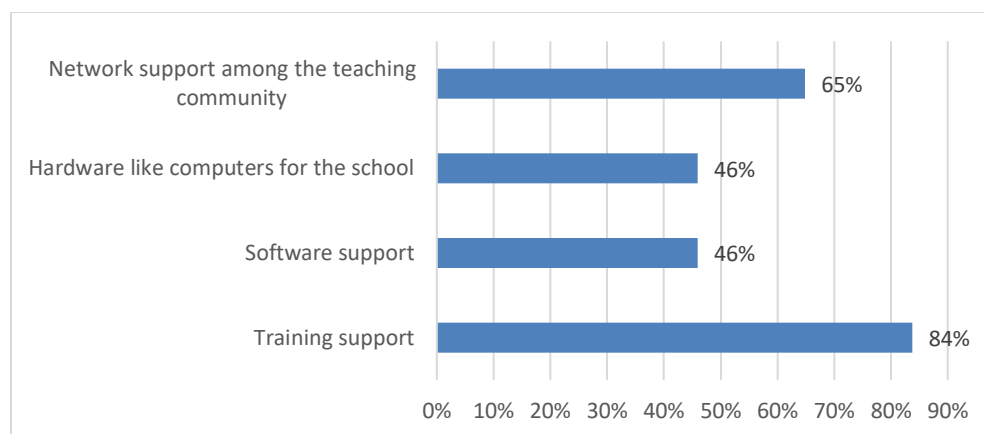
### Feedback from Teachers

The SAN survey covered 37 teachers, out of which 25 were female and 12 were male teachers, from government and government-aided schools. More than 60% of the teachers surveyed were postgraduates teaching Mathematics, Kannada, English and Science. 92% of them acknowledged the training support provided by ITfC and admitted that their understanding of the open-source software has improved. They are now adept at the use of OER in their teaching learning activities and many of them are familiar with the tools.

Geogebra was by far the most popular software tool used in the classroom. 19% of them are also using Audacity and Phet regularly. Teachers are slowly making attempts to create tools for their own use. More than 60% of the teachers have agreed that the response of the students to ICT and their performance is positive.

More than 50%, have appreciated ITfC's efforts to connect them with the wider teaching community, which has enabled ease of exchange of information and resources. Teachers have agreed that they are able to participate as learners in the workshops, discussion forums, webinars, etc., and have acquired the ability to update their knowledge and skills in online teaching.

Figure 2 – Support received from ITfC



Besides training support at the block level, ITfC has hand-held many teachers individually to help prepare and use ICT tools for their regular classes.

78% of the teachers have stated that ICT training made the shift to online teaching easier. Communicating with the students became easier. Since teachers and students were both online, digital tools could be used effectively.

However, ICT integration in everyday teaching is still at an early stage of acceptance. Infrastructural limitations like absence of a smart class restrict the regular usage of ICT tools during regular classroom teaching. Moreover, teachers stated that it was difficult to gauge the attention of the students during the class and assess their performance in a continuous manner.

**FGD with Teachers**



**FGD with Students**



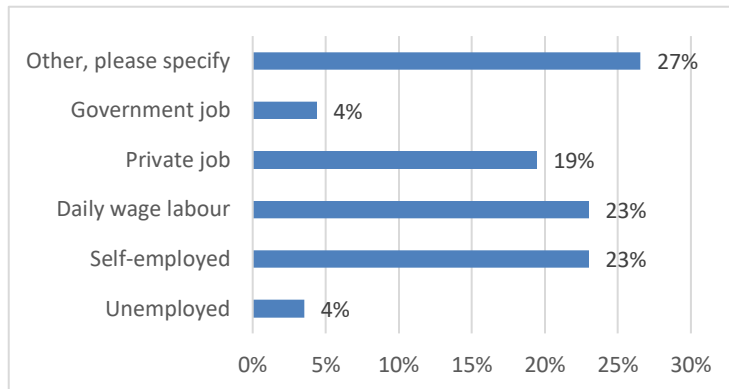


## Student Feedback

65 boys and 51 girls were surveyed; 60% were from Grade 8.

### Profile of students: Socio-economic status

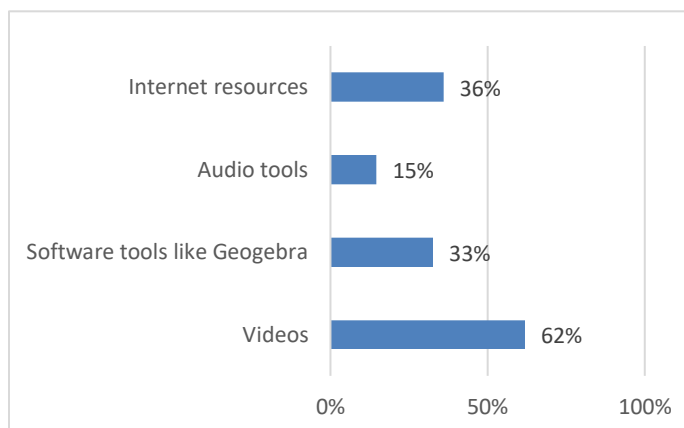
Figure 3 - Profile of students – Father’s Occupation



All the students surveyed have confirmed that they have a computer lab in their school and have regular allotted periods in their timetable for ICT classes. Students have corroborated that their teachers are using ICT resources like videos and software tools like Geogebra in the classrooms.

### Student Responses: Teachers’ use of digital tools in the classroom

Figure 4 - ICT Tools used in Class



During the second wave of the pandemic, 95% of the students have managed to acquire smartphones for attending the online classes though 50% said that they had to share them with their siblings. 73% said that they have continuous access to the Internet.

A majority of the students have agreed that their understanding of concepts has improved and they are more skilled in the use of computers and the Internet now. 47% of the students have used digital tools in

their regular school projects. Around 20% to 25% of students, however, are still not sure about their ability to use the software tools and access the learning resources.

73% of the students have attended the online classes organized by ITfC during the pandemic. Most of them also attended the sessions on Mathematics.

Online classes have sparked their interest in education and helped to maintain the learning continuum during the pandemic. The students have corroborated that their digital skills have improved. However, students feel that they get easily distracted during the online classes, their writing skills have drastically suffered and they do not get enough interaction with their friends for peer learning.

### **Karnataka Open Educational Resources Portal**

Karnataka Open Educational Resources (KOER) is a resource repository that aims to provide relevant and contextual educational resources to all teachers and learners in Karnataka, covering all subjects in the state syllabus from classes 1 through 12 (K1 - K12).

All content created and uploaded on KOER is licensed as OER using a Creative Commons license.

KOER is being maintained by IT for Change, which also curates resources shared by teachers on mailing lists. Resources shared by other organizations, as well as those sourced from the world wide web, make up a resource repository relevant to the teachers of the state.

The material published in the KOER includes:

- Resources for Mathematics covering topics in Algebra and Geometry
- Resources for language learning, covering lessons from Kannada text books which were transacted by the team with the teachers.
- Resources for digital literacy, expanding the user manual for applications such as Indic Anagram and Inkscape, Audacity, Tux Paint etc
- Readings on education and teacher education translated to Kannada, relating to language and mathematics teaching, as well as larger issues in education.

A total of 1,922 resource materials for Math and Kannada have been developed by ITfC and the school teachers, covering various topics, and published on the KOER portal during the assessment period.

ITfC has developed the ICT student text book and teacher hand book in line with the NCERT ICT Curriculum Samples of resource materials developed can be found in these links. Further samples are included in the Annexures.

[https://karnatakaeducation.org.in/KOER/en/index.php/Maths\\_topics\\_by\\_class](https://karnatakaeducation.org.in/KOER/en/index.php/Maths_topics_by_class)

<https://karnatakaeducation.org.in/KOER/index.php/ವರ್ಗ:ಮಗ್ಗದ ಸಾಹೇಬ>

Teachers are aware of the KOER portal as an important resource repository, but, as of now, very few of them seem to be actively accessing these resources for their regular classroom teaching.

## 8. Planned vs Achieved

Milestone for the Reporting Period	Planned	Achieved	%	Remarks
No. of schools covered	42	65	155%	The pandemic gave the impetus for more schools to join the online interactions
No. of teachers covered	246	386	157%	These include teachers from Government and government aided schools
No. of students covered	12,264	19,855	162%	These numbers include (a) Students directly impacted in classes (b) Online sessions which included students from aided and other schools (c) The students of teachers who attended the offline workshops (d) Students of teachers who attended online workshops
No. of Workshops Teachers' Community Learning)	30	27	90%	Yes, Done.
No. of Orientation for schools, teachers and parents	21	12	57%	These are one-off sessions where the schools are sensitized about the need for ICT
No. of schools where ICT is being integrated	52	43	83%	After the Block level training, many teachers in their individual capacity reach out to ITfC for support. The output is based on such requests
No. of teachers using digital tools for learning and teaching	44	68	155%	This data is arrived at based on the informal interaction with the teachers.
Designing, developing, transacting technology integrated modules -New pedagogies				Content developed and taught in class using ICT
No. of Content in Mathematics and Kannada lessons	90	112	124%	Data based on content created for class room teaching for specific teachers in the school level intervention program
Resource creation - OER accessed from the web and evaluated	200		100%	Yes, Done. There was too many to document.
Resource creation - No. of Mathematics and Kannada OER developed – files	120	670	558%	Yes, Done.
Resource creation - No. of Mathematics and Language resource pages on KOER	60	2,092	348%	Yes, Done.

## 9. Evaluation of Program Objectives

The objectives were evaluated using the **RCEESI framework**. RCEESI framework measures the performance of the program on five parameters – Relevance, Coherence, Effectiveness, Efficiency, Social Impact and Sustainability. Specific indicators for the consolidated activities under each objective were evolved to arrive at the composite score. The scoring was done based on the outcomes described in the body of the report, and based on observations and insights drawn from the study.

Relevance – assess the extent to which program responds to the felt needs of the communities.

Coherence - assess the extent to which other interventions (particularly policies) support or undermine the intervention, and vice versa.

Effectiveness – assess the extent to which the objectives of the program are being met.

Efficiency – assess the extent to which the program delivers results in an economic and timely way.

Sustainability – assess the extent to which the benefits of the intervention continue, or are likely to continue.

Impact - assess the difference made on the ground, taking into account both intended and unintended consequences

### Relevance

The TCoL program was conceived in 2012 and after piloting in 5 government schools, was implemented in 16 schools. After successfully running the program for two phases in the government schools and fine-tuning it to a certain level of maturity, ITfC extended the TCoL program to the government-aided schools in 2018. The program had evolved enough to be extended to more schools in the same geography, catering to a similar target group.

These government-aided schools are run by Trusts or Foundations with limited resources for professional development of teachers. These teachers do not get many training opportunities as compared to teachers in the government schools. This program has therefore great relevance and significance for the targeted teaching community. Meticulous due diligence has been done by ITfC to identify schools for their school level interventions. Most of the schools cater to marginalized students and are short of funds to build digital infrastructure.

The pandemic also accentuated the need and deepened the relevance of ITfC's program, enabling transformation of the learning environment.

These programs have been endorsed by the State Education Department. Many of the schools also now feel the need to digitize their systems to transact with the Education Department.

### ITfC's online classes attended by students

Figure 5 - ITfC Online classes attended

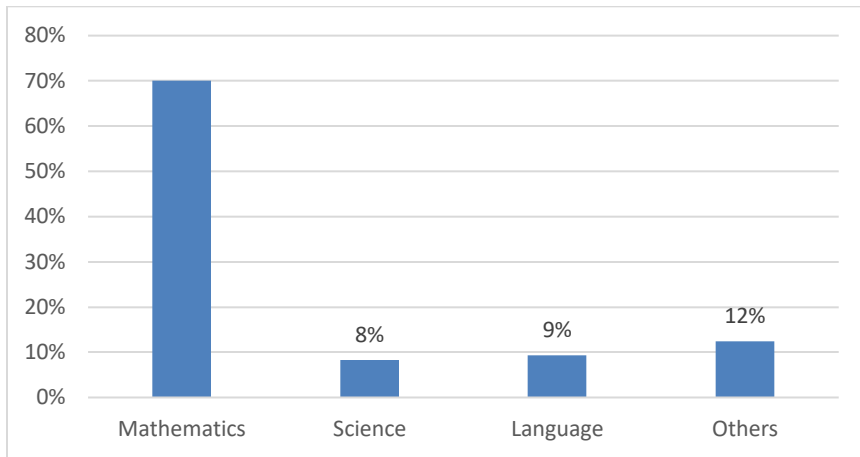
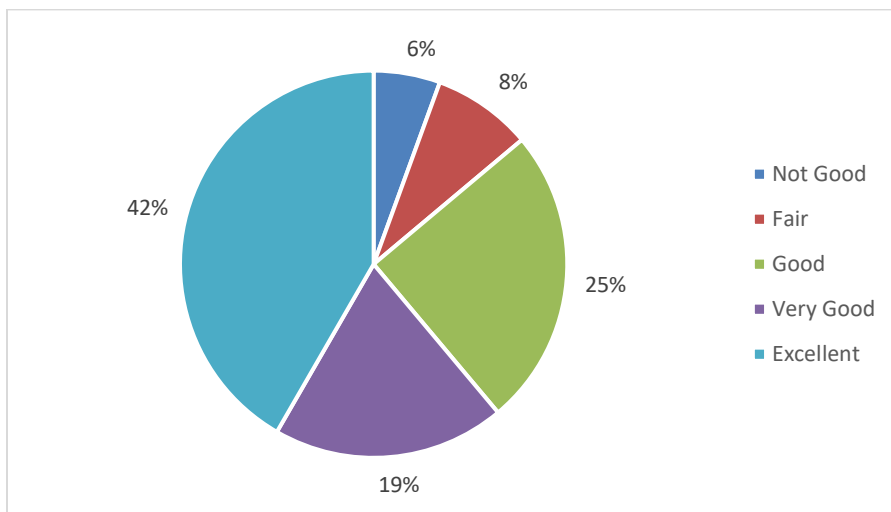


Figure 6 - Teachers feedback on students' performance



## Coherence

Though there are other organizations working on teacher development, ITfC's focus on digital skills for high school students and teachers seems to be unique in this sector as they also collaborate with local NGOs to build digital infrastructure in the schools. In the regular teacher development training programs held by education departments like DSERT and DIET, ITfC is their knowledge partner for conducting ICT related courses. Since the stated mandate of IT for Change is to "build participatory models that strengthen teacher agency, school autonomy, adolescent education and community participation", the program is very much a focus area for them. This program aligns with CF's focus area of improving and inspiring the lives of the underprivileged, which includes education.

## Effectiveness

Integration of ICT in the education system started in 2013 where the emphasis was more on digital literacy. Subsequent educational policies have tried to incorporate ICT in the teaching- learning process, with various models being tried out like the smart class model, the distance-eLearning model and computer aided learning. Some of the limitations of these models have been infrastructure limitations, lack of skills in the teachers and limited content in the local languages.

While many players are involved in the integration of ICT in the classroom, what sets ITfC apart is that they are filling the missing links in the learning continuum by shifting the ownership in creating the learning experience to the teachers and students. Besides the teacher development workshops, ITfC engages with them to create digital content in various subjects. Content which is uploaded in the OER portal is first validated and further refined by the ITfC team for the consumption of the general teaching community. They also work with the students to adopt ICT tools in the daily learning process by providing hands-on learning opportunities in the form of workshops, digital story-telling exercises, Digifests and data mining exercises.

The training given to the teachers and the children has been well-appreciated by the target audience. Their sensitization camps like Back to School and other workshops have been well-received by the community and have ensured the continuation of teaching and learning. ITfC has been very effective in addressing the underserved children, particularly during the pandemic.

In order to ensure smooth deployment of the program and to mitigate the issues, ITfC has put in place three levels of evaluation systems:

1. Event evaluation – which is to take feedback from the stakeholders followed by an internal review of how the program was conducted
2. Weekly review meetings to evaluate the work done on the ground and the required course corrections
3. Evaluation is done while putting together the reports to funders, wherein every minute detail is documented and reported.

The goal of inclusivity is being addressed at two levels: firstly, students from the underserved community now have access to the digital world. And secondly, this access has created confidence and lowered the inhibitions of the students in communicating with their teachers and helped in inclusivity within the classroom.

*Overall, the program is fulfilling a present as well as the future needs of the community by building inclusiveness.*

Figure 7 - Teacher's understanding of Free and open-source software

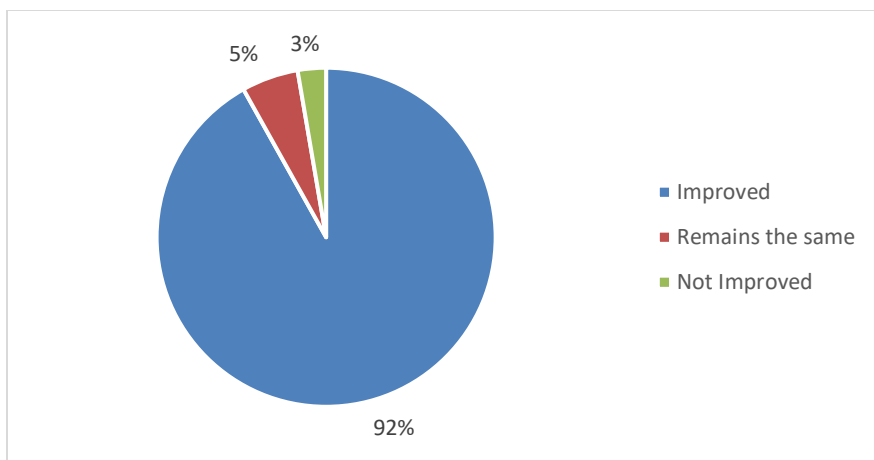


Figure 8 - Teachers feedback on effect of ICT

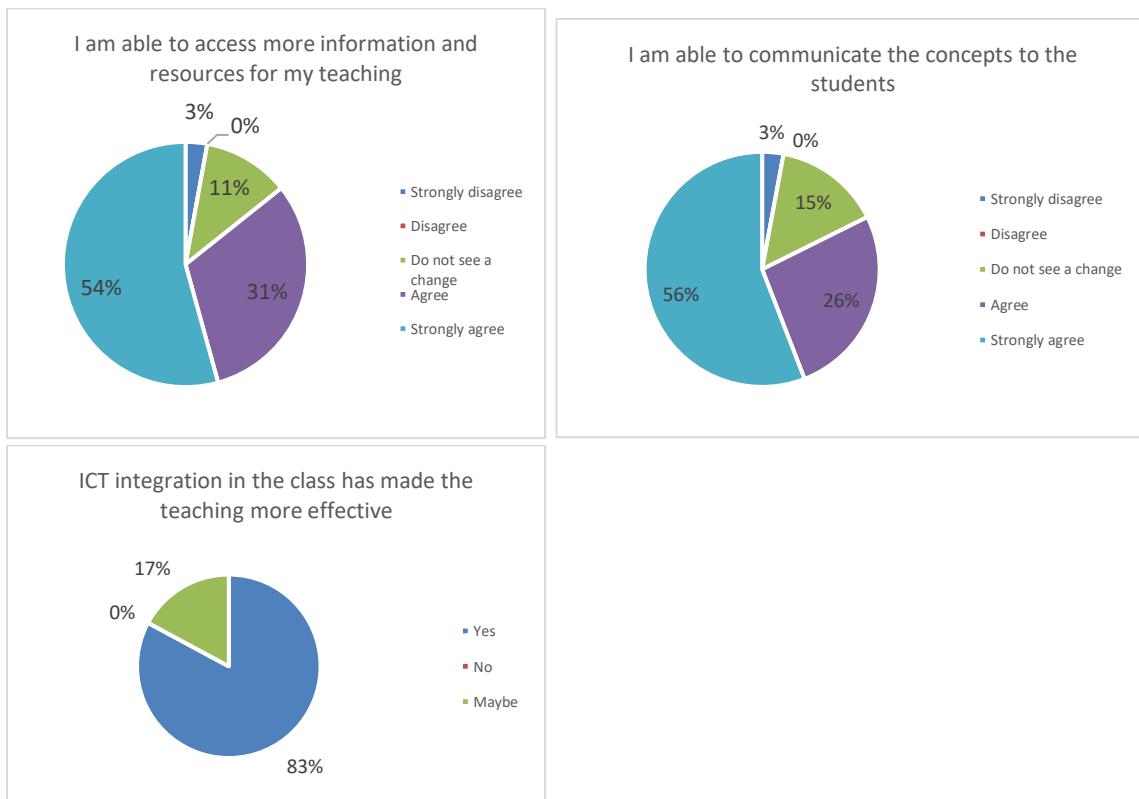


Figure 9–Student’s Feedback on Effect of Digital training

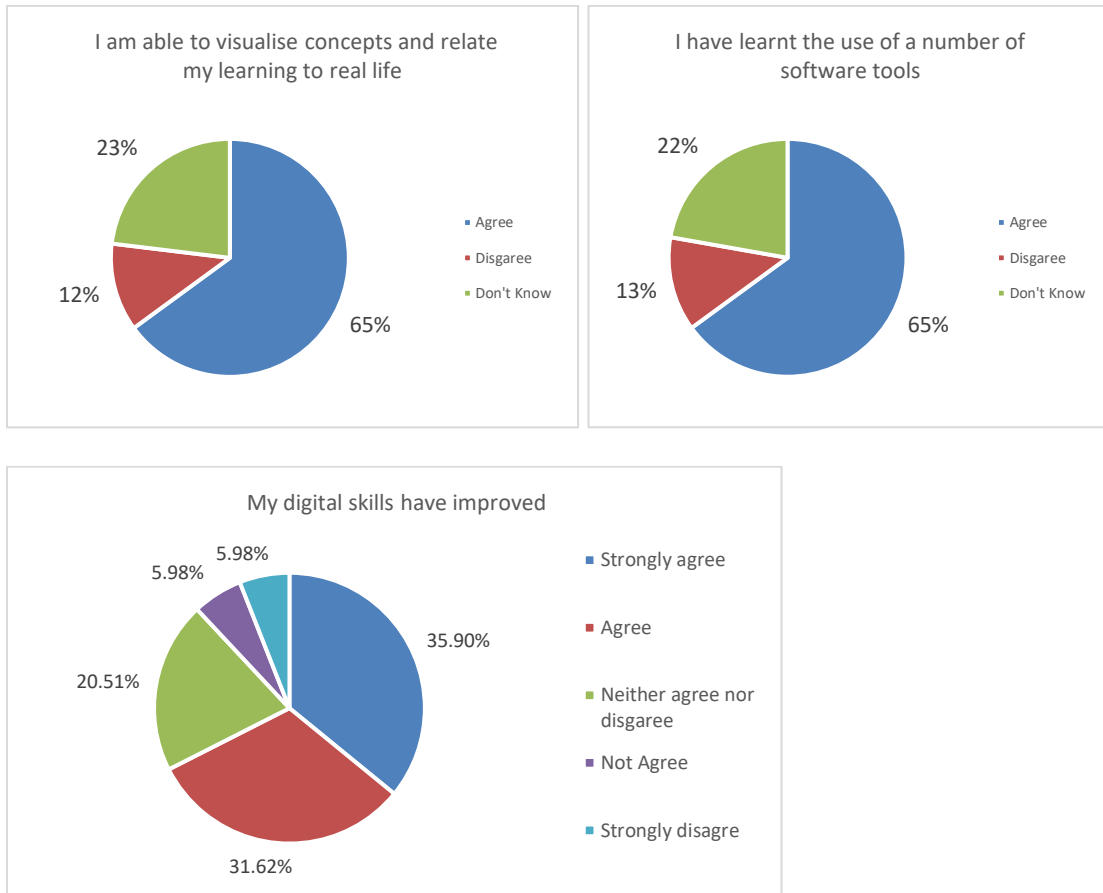
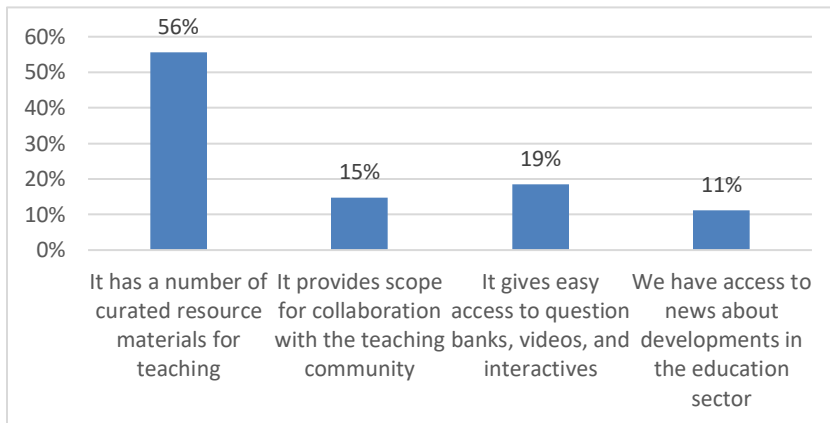


Figure 10- Feedback from students on usefulness of KOER





## Efficiency

ITfC has managed to run the program within the budget of the grant provided. The two major costs of the program are people cost and program expenses. ITfC has been in this field for a number of years and they have built up credibility in the sector to attract the best people to work with them. As for infrastructure required for the delivery of the program, the cost is minimal, since the infrastructure in the schools is being supported by CF's donation of de-bonded computers for the labs. During the assessment period 535 computers have been donated to 27 institutions.

IT for Change encourages the use of FOSS at every level of operations for themselves and within the schools they work with. At the school level they encourage the use of software like Geogebra, Audacity etc. For online teaching, schools used Big Blue Button, with the process being facilitated by IT for Change. All of these indicate use of digital solutions which are comparable to market products. These efforts have resulted in a significant cost reduction for these schools which are typically charity-based.

## Sustainability

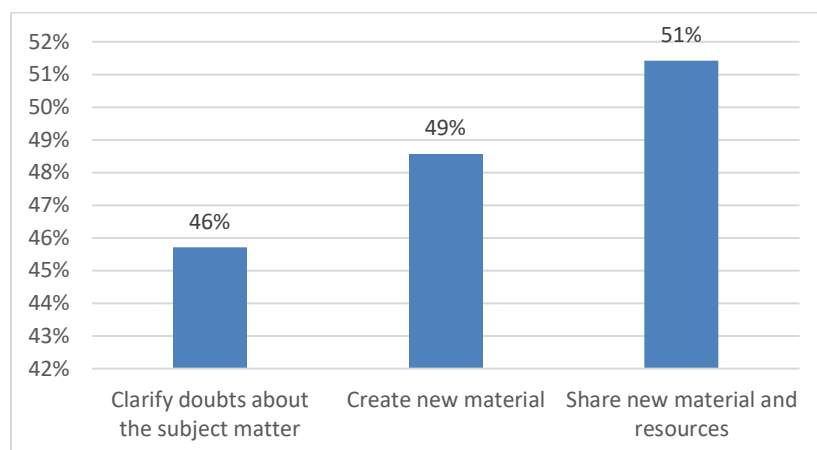
To ensure sustainability of interactions among teachers at the Block level, they have been connected to the wider community through WhatsApp groups and email. IT for Change constantly monitors their interactions and updates them about recent developments and new teaching resources.

At the school level, they have ensured that the schools are equipped with minimal digital infrastructure and support staff to run the computer lab. The teachers have been equipped with skills and resources and free platforms for accessing information.

The pandemic has seen to it that the online learning and digital resources will be embedded into the regular teaching processes, thus complementing the integration of ICT efforts put in by IT for Change. In the years to come, ITfC plans to expand the program to primary school teachers and pre-service teachers. They also plan to sustain their efforts to advocate for policy changes.

ITfC has a well-qualified research team which has tested ideas on the ground and published a number of research and white papers in journals and media platforms on how to integrate ICTs in the public education reports. They have also been presenting papers in educational conferences and have been working in close association with Azim Premji Foundation in the field of research in school education.

Figure 11 - Engagement with wider teaching community



### Impact

The study has analysed the transformation brought about by ITfC's efforts on teachers and students and notes the intended and unintended consequences of these efforts.

Today both teachers and the student community seem to be excited about using digital resources for the teaching-learning transactions. They are also keen to upgrade their skills on a continuous basis. The efforts of IT for Change as well as the pandemic effects have made the students and teachers technology savvy. The teachers and students have realized the importance of ICT, especially in the present-day context, and have accepted its place in the classroom transactions.

IT for Change has played a significant role during the pandemic. The pandemic necessitated all the teachers of all the subjects to get acquainted with digital skills. While the initial program was designed for Math and Language teachers, most of the other subject teachers were not exposed to ICT and were apprehensive about the usage of digital tools. IT for Change conducted specific training programs for all the teachers in the targeted schools and handheld them individually and skilled them to conduct online classes.

Perceiving that many of the children did not have access to gadgets during the regular teaching hours of the school, IT for Change conducted open online classes in the evening on all subjects for the schools in South 3 Block. This support by IT for Change was critical to maintain continuity in the education of these children.

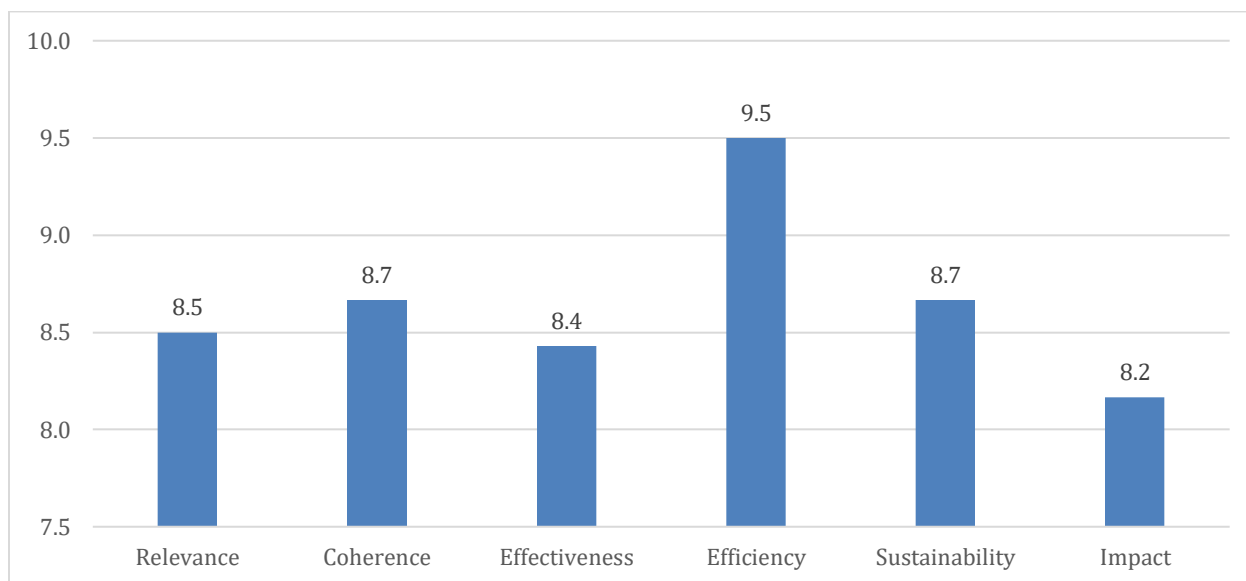
While exposure to the digital medium of education has had its positive aspects, some of the unintended impacts have been the over-exposure of digital tools to young minds and distractions have become multifold. Many students have become addicted to mobiles, with their physical activity drastically reduced.

Table 4: RCEESI Ratings

Category	Process/Performance indicator	Score	Average Score
<b>Relevance</b>	Does the project/ programme cater to children from economically and educationally underserved background?	8	<b>8.5</b>
	Does the project/ programme provide access to quality education for underserved children?	9	
<b>Coherence</b>	Does this project/ programme complement or clash with any other initiatives/priorities at local/state/national levels?	8	<b>8.7</b>
	Does this project align with the partner's area of focus?	9	
	Does this project align with CF's area of focus?	9	
<b>Effectiveness</b>	Has the programme achieved its intended target?	8	<b>8.4</b>
	Has adequate capacity in terms of infrastructure and team built that is required for effective delivery?	9	
	How the digital literacy programme is benefitting the candidates	8	
	Does the program satisfy / fulfil the real need of the community?	8	
	How is the quality of the training delivered?	9	
	Are people, processes, and platform that are required for effective delivery of the project in place?	9	
	Does the project/programme have a proper feedback mechanism to capture the voice of the stakeholders and takes appropriate corrective measures?	8	
<b>Efficiency</b>	Does the project/programme meet the targeted output at a planned cost?	10	<b>9.5</b>
	How does the NGO partner save cost for value-added services like higher education, career counselling, etc.?	9	
<b>Sustainability</b>	Is there a systematic plan in place to make project sustainable?	9	<b>8.7</b>
	Is the program relevant to the existing skill ecosystem? And the forecast for next three years?	10	

Category	Process/Performance indicator	Score	Average Score
	Is there a sustained Interest among the students in online learning?	7	
<b>Impact</b>	Has the project/programme created its intended impact for the teacher and student community?	9	<b>8.2</b>
	Is the project/programme managed well to keep its unintended impact bare minimum if any?	6	
	Has this programme created interest to perform well among teachers and students?	7	
	Has the programme sustained the interest in teaching/learning?	8	
	Are the children tech savvy after this intervention?	9	
	6. How useful was the support from ITfC for learning during the pandemic?	10	

Figure 12 - RCEESI score



## Outcomes

### Teacher Outcomes

<b>Outcome/Impact Indicators</b>	<b>Rating</b>
Knowledge of digital tools for teaching	8
Understanding of FOSS	8
Better understanding of OER	8
Integration of digital tools into lesson planning	7
Increased use of digital tools for classroom teaching	7
Better exchange of information within the teaching community	6
Better engagement with students	9
Ability to communicate concepts with clarity	8
Ability to participate in online forums	7
Improved teacher agency within the school	8
Ease of handling online classes during the pandemic	9
<b>Average rating</b>	<b>7.7</b>

### Student Outcomes

<b>Outcome/Impact Indicators</b>	<b>Rating</b>
Improved exposure to digital learning	9
Understanding of digital tools and their operations	9
Access to learning tools	8
Ability to communicate using digital means	9
Better understanding of subjects taught in regular class	8
Ease of learning through online classes	8
<b>Average rating</b>	<b>8.5</b>

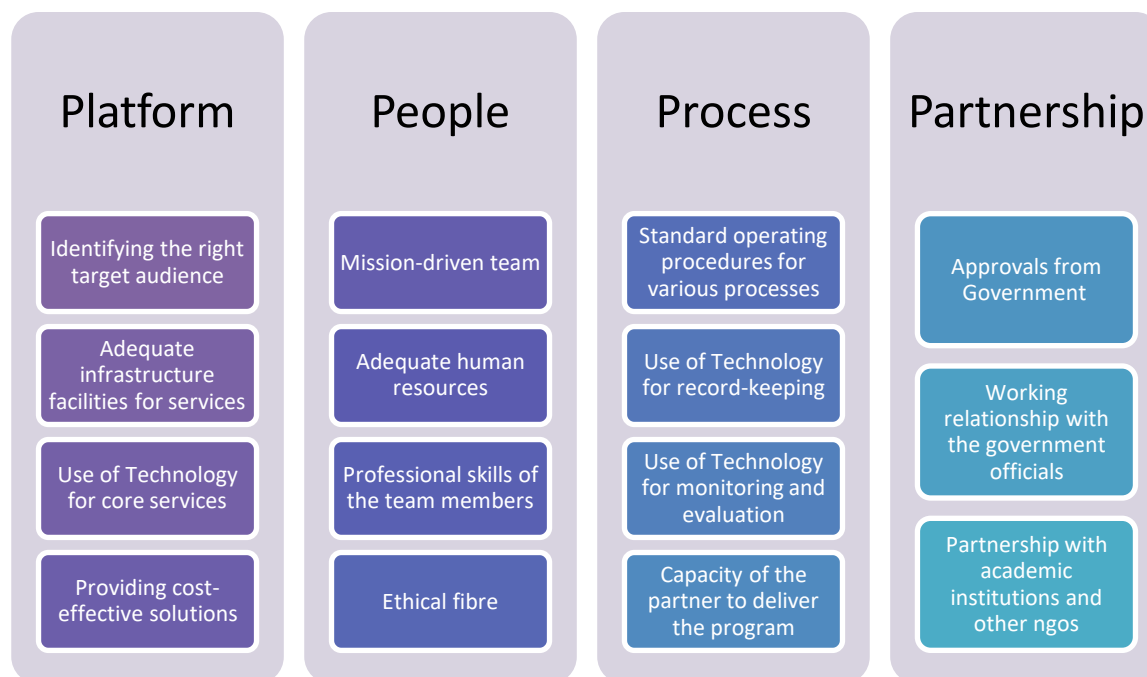
## 10.

## Platform, People, Process, Partnership

The success of any social intervention is dependent on four factors:

- f) The platform it creates for social change
- g) The commitment of the people associated with it
- h) The processes it maintains to track the social change
- i) The partnerships forged for collaboration and advocacy

To assess the success of the ITfC program the following KPIs were verified



### Platform

ITfC has identified the suitable audience to implement its ICT programs in education. The Government-aided schools are much starved of funds to meet their regular requirements and work mostly on a charitable basis. By providing de-bonded computers through CF, they have helped create the infrastructure for these schools and aided in taking the ICT program forward. Use of FOSS has future enabled in providing cost-saving solutions.

Table 5-Rating for Platform

Identifying the right target audience to deliver the program	<b>10</b>
Adequate infrastructure facilities for offering services	<b>9</b>
Use of Technology for core services	<b>10</b>
Providing cost-effective solutions for sustained effectiveness	<b>10</b>
<b>Average</b>	<b>9.75</b>

### People

ITfC has a dedicated skilled team deployed both as trainers for the teachers as well as instructors for the children at school. The approach of the trainers has helped overcome the inhibitions, both for the students and the teachers.

Table 5 - Rating for People

Mission-driven team	<b>9</b>
Adequate human resources	<b>9</b>
Professional skills of the team members	<b>9</b>
Ethical fibre	<b>10</b>
<b>Average</b>	<b>9.25</b>

### Process

The program is designed well ahead to integrate with the teacher-student timetable. The various objectives of the training programs are clearly specified and the curriculum is designed accordingly. Being a tech-based service provider, most of their processes are driven with the aid of technology.

Table 6 - Rating for Process

Standard operating procedures for various processes and systems put in place	<b>10</b>
Use of Technology for record-keeping	<b>9</b>
Use of Technology for monitoring and evaluation	<b>8</b>
Capacity of the partner to deliver the program	<b>9</b>
<b>Average</b>	<b>9</b>

**Partnership**

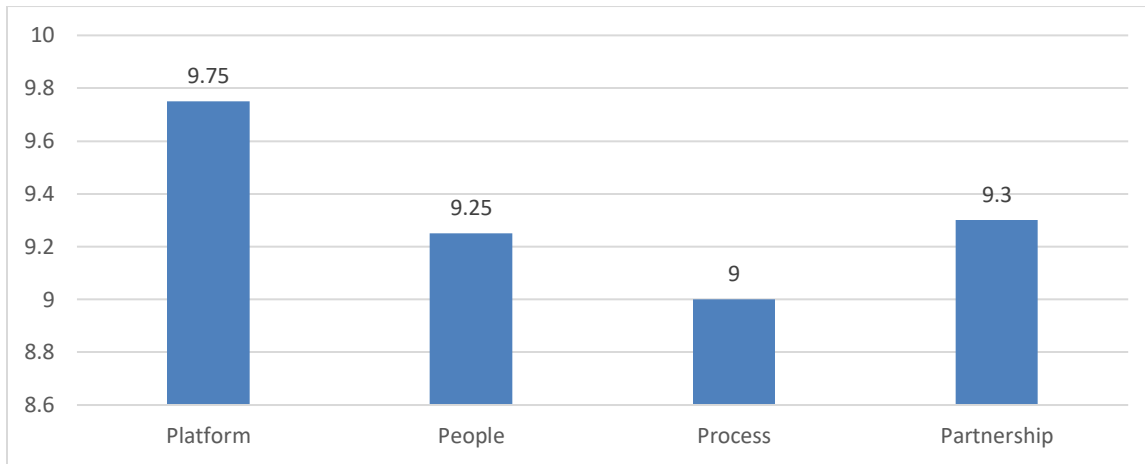
For the successful implementation of the program, it is essential that the right partnership and network be developed. ITfC has been providing the service for the last 10 years and is well supported by the government and education-related agencies. Research being of its core strength, it has developed networks with academia and other related organizations

Table 8- Rating for Partnership

Approvals from Government	<b>10</b>
Working relationship with the government officials	<b>9</b>
Partnership with academic institutions and other NGOs	<b>9</b>
<b>Average</b>	<b>9.3</b>

Based on the above findings, the average rating for ITfC, based on the PPPP criteria is shown in the graph below

Figure 13 - PPPP score





## 11. Feedback from Stakeholders

### Teachers:

*“ITfC has helped the students immensely by introducing the concepts in the play-way / puzzle-oriented method. Children’s interest in our regular class has improved. Having followed a certain pattern of learning during the pandemic, today they can concentrate in class and follow the pattern and structure while we teach, listen with interest, and share more examples during the class. There is more involvement of the students in the class.” – **Language teacher at Hombegowda Boys High school.***

*“ITfC helped us to adopt techniques that will be helpful for our teaching. Teaching is effective when we use advanced tools. Earlier we didn’t have much knowledge about these tools, but now we are able to take online classes too.” – **Teacher at MES School***

*“As a part of the digital storytelling and also social science syllabus, students were taken to public places such as banks, post offices, libraries to study the transaction that happens. They were pre-prepared to make notes of important aspects and observations. Based on their first-hand experience, the students presented the findings in a story format using ICT. This was a very useful exercise for the students - **Teacher at MES School***

*“We are a part of the WhatsApp group and connected with the teacher’s community. We do exchange resource material. But not much exchange happens in these forums.” - **Teacher at MES***

*“The KOER that ITfC has developed is a wonderful resource for us. However, most of the teachers do not know how to use the resource: collect the information and download it and use it in the classroom situation. My suggestion is ITfC has to teach all of us how to use the KOER. The teacher should become more familiar with the tool.” – **Teacher at Hombegowda Girls High School.***

*“ We are not very adept at creating digital resources for our classes. We are short on time, also we feel we need more training on creating these tools. Also, we feel that it should be extended to all subjects”- **Teachers from St Euphrasias Girls High School.***

*“ITfC also did a detailed discussion with the teachers concerning the New Education Policy, took our suggestions and opinions, and also gave training concerning the various aspects of the new policy. We could discuss our pain points with them regarding our subject teaching - **Teacher in Hombegoda Boys High school***

### **Support during the pandemic**

*“ITfC took online classes for students during the pandemic- math, science, Kannada. The lessons were based on the syllabus, we dealt with the regular teaching and they supported us by illustrating the same concepts through software. Before the pandemic, they supported us with the Kannada class - their resource staff would come and take classes in grammar using the software. As it was more visual, the students could grasp it easily and enjoyed the learning process. Besides, they also dealt with soft skills, especially in language class, encouraging the students to practice their reading, listening, and speaking skills - to improve the fluency of the language skills. – **Teacher in Hombegoda Boys High school***

*“Mr Gurumurthy was instrumental in motivating and keeping the teacher’s interest in taking classes, especially during the second COVID wave, by highlighting the importance of the children’s future and encouraging us to keep the fear of Corona aside. ITfC organised a book reading session – Diva Swapna by Gijubhai Badheka - stories regarding teaching and related issues, we had reading sessions of it, followed by discussion. We enjoyed the session, it was like an eye-opener for us. It was a wonderful experience. - **Teacher in Hombegoda Boys High school.***

### **Principals/HMs**

*“Going forward, if Technology needs to be integrated, we need to have smartboards or a laptop with a projector in the classrooms, this will help us do our regular teaching along with the ICT integration” – **HM from MES school.***

*“Teachers are also getting upgraded with digital skills. Earlier most of the work was done manually, now even the departments are asking us to send the reports digitally. The present-day world is technology-based, hence we have to get upgraded.” – **Principal of Hombegowda Girls High School.***

### **Students**

*“The pre-pandemic training on ICT was a boon as it helped us to transition to online learning very easily. The earlier basic training on using computers helped us to use the Big Blue button comfortably” – **Student of St Euphrasias Girls High School***

*“The staff of IT for Change conduct classes in a very friendly manner. This enables us to overcome our fear and engage in the learning process. Today we feel confident to conduct ourselves in our regular class too without any fear or apprehension.” - **student of St Euphrasias Girls High School***

*“We like the ITfC classes, the teaching is very nice, mathematical lessons on shapes were shown in the video format using Geogebra. The teacher’s explanation helped us to understand clearly. In Science we were shown diagrams of organisms and aids have been used in language classes too– **Student from Hombegowda boys school***

### **Alumni**

*“Three years ago, when IT for Change was introduced to us, we were wondering what they will offer to us. As the sessions progressed, we understood the importance and relevance of the usage of computers since most of us do not possess such tools at home. Two major takeaways were- the use of animation for story-telling and Geogebra for learning Mathematic concepts. They encourage us to participate in the events organized, especially Digifest. I was lucky to have won at both Digifest events conducted by them – **Alumnus of St Euphrasias Girls High School.***

## 12. Key Findings

### ITfC's Collaboration and Advocacy Efforts

- IT for Change has networked and has active engagement with important agencies of Karnataka Education Department to conduct its TCOL program
- The draft National Education Policy (NEP), released by MHRD reflects the inputs provided by ITfC in consultations, in the 'Technology' section. The policy acknowledges ITfC as a contributor.
- ITfC participated in the NCERT Class 10 ICT Text book review, organized by CIET, NCERT, and provided inputs to the review, from TCOL experiences and learnings.
- They have also engaged with teaching institutions like Azim Premji Foundation to broaden their sphere of influence in the sector.
- ITfC has published a number of white papers on the subject of ICT and pedagogy. It has also been working closely with state level departments and organizations for advocating and influencing policy level changes. For instance, they have recently published articles advocating the need to open up the schools after the pandemic to ensure that the learning gaps are minimized.
- Most recently, articles by ITfC have been published in mainstream media advocating the safe and gradual opening of schools and exploring the challenges of online education.
- ITfC has also been involved in setting up the 'National Coalition on Education Emergency' to help to re-imagine school education in the light of the changes that the pandemic has forced upon the sector.

### Block-level Teachers' Training

- The teachers have given positive feedback on the block level training conducted during the assessment period. The training helped a lot of the teachers to overcome their inhibitions and apprehensions towards digital teaching
- The training enabled the teachers to create many of their own teaching tools
- Many schools have transitioned to the use of digital applications for their administrative use. The introduction of IVRS was found to be very effective during the pandemic period.
- The hand-holding by ITfC at the school level helped to integrate many of the teaching strategies developed during the Block workshops

### School-level Interactions

- ITfC has also conducted onsite classes to help build fluency in language through well-developed methodologies
- Many of the schools have fully functional computer labs which are being monitored and supported by ITfC
- Students have acquired basic digital literacy and are able to operate the computers comfortably, create files, send emails, use tools like PowerPoint, Paint etc
- Experiential visits helped to connect classroom learning with real life situations which was appreciated by the teachers and students
- Digifest provided a forum for the students to exhibit the digital skills acquired

- **One of the objectives of the grant was to provide an orientation for schools, teachers and parents on inclusive education approaches to facilitate early detection of learning delays and exploring technology-mediated solutions. Work on this objective has not yet been initiated due to various factors, including the pandemic**

### Development of KOER

- ITfC has devised and curated a number of teaching resources in Maths and Kannada which are published on the KOER portal
- The Geogebra software was customized in Kannada language interface by the ITfC team, to make it easier for Mathematics teachers who teach in Kannada medium.
- While the teachers are aware of the presence of this repository, only 40% of those surveyed said that they used these resources. Very few of the teachers have created their own resources to be published. **The teachers feel a need for more training on this aspect. Most of the teachers do not seem to be making use of the computer labs for their own lesson preparation and learning**
- The focus during this period has been on creation of resources for Mathematics and Kannada. **Teachers have expressed the need for more such resources for all other subjects**

### Usage of ICT

- Among the software tools, Geogebra and Audacity have been used extensively by teachers and students
- Digital learning has helped in students' understanding of concepts. It has been appreciated by both students and teachers. It helped them to gain confidence and skills to present their work to a larger audience
- Students who were earlier hesitant to ask questions to the teacher in regular classes, felt more confident to engage with the teacher after attending the ITfC sessions. **Students attributed this to the better understanding gained of basic concepts in different subjects. Knowledge of digital tools has given them more of a sense of agency towards their own learning**
- While efforts have been made by ITfC to connect the teachers to the wider teaching community through WhatsApp groups and email forums, **there has not been much interaction among the teachers of the government-aided schools**
- Students have expressed their preference for offline teaching since they could have direct interactions with the teachers and their peer group.

### Pandemic Effects

- ITfC was a big enabler in helping students and teachers to move seamlessly on to online learning/teaching during the pandemic. The training on usage of Big Blue Button for the teachers helped them to conduct online classes regularly
- Since the students in aided schools are from a lower socio-economic background, many of them had difficulty in attending online classes in the initial days of the pandemic. 30% of the students surveyed stated that they did not have suitable gadgets and network support
- ITfC, realizing that students had limited access to the gadgets, conducted online classes in the evenings which were attended by 70% of the students surveyed
- Mathematics classes, conducted by ITfC, in particular, were attended by most of the students

### 13. Recommendations

- The teachers could be provided with a platform to showcase their creations and resources on the lines of Digifest. This will also help teachers of aided schools to communicate and interact with each other
- The teachers should be actively encouraged to use the resources in the KOER portal
- Besides the students using the computer labs, the subject teachers should be encouraged to use the lab for their own research and class preparation work
- Workshops on subjects other than Kannada and Maths should be undertaken
- ITfC has done quite extensive research and published a number of research and white papers. Summaries of these and new developments in the education sector, including digital tools, could be presented in a newsletter and distributed on a regular basis to the participants in the TCoL program
- Every class can be equipped into a smart class to facilitate digital teaching and learning. Introduction of projectors will enable the classes to be transformed into smart classes
- The pandemic saw the extensive use of digital technologies for learning and teaching. A plan should be put in place to ensure that the gains are maintained and things do not go back to the status quo within the classrooms.
- Since digital addiction could be a possible unintended consequence because of long exposure, ITfC could plan special workshops or orientation classes on digital hygiene as a part of the digital literacy program

### 14. Conclusion

Having worked for more than four years with government schools, ITfC has a good working model for teacher training in use of digital resources. They have been able to induct a good number of teachers of government aided schools into their workshops. Though the pandemic threw the whole system off track for a few months, ITfC has quickly garnered its resources and helped the teachers with what they needed most at that time – they have facilitated online teaching and also taken up online classes in different subjects for hundreds of students, at a time that was convenient to them, ensuring continuity of learning.

Their active engagement with the schools has helped them gain insights into the sector as a whole, which has resulted in numerous publications in influential media. They are also pursuing advocacy measures for policy change by active collaboration with the government and civil society organizations. They are also very aware about the importance of the human element in education and acknowledge that technology can only be used as a tool to enhance the teaching and learning experience

## Annexure 1: List of Schools

Name of the government -aided schools

Table 9 - List of TCOL schools

	Name of the schools
1.	Bangalore Education School (BES) High School, Jayanagar
2.	Bangalore High School, Jayanagar 4 <sup>th</sup> block
3.	Divyajyoti High School
4.	Gangamma Hombe Gowda Girls High School
5.	Jnanadegula High School, BTM Layout
6.	Hombe Gowda Boys High School
7.	Vidya jyoti Primary and High School
8.	Kamala Nehru Boys High School, Yadiyuru
9.	Kamala Nehru Girls High School, Yadiyuru
10.	Loyola Boys High School, Kalena Agrahara
11.	MES, Jayanagar
12.	RS Madiwala High school
13.	Sacred heart Boys, Brigade Road
14.	Sri Chanakeshava High School Singasandra
15.	St. Antony's High School
16.	St. Euphrasias High School, Brigade Road
17.	St. Patrick, Brigade road
18.	St. Teresa High School, Begur
19.	Jnanadegula High School, BTM Layout
20.	Vidya jyoti Primary and High School

## Annexure 2 - List of Publications

[https://itforchange.net/resources\\_all?field\\_publication\\_type\\_target\\_id=959&thematic\\_areas\\_target\\_id=67&field\\_author\\_new\\_target\\_id=1205&field\\_year\\_value=All&field\\_project\\_target\\_id=1138&body\\_value=](https://itforchange.net/resources_all?field_publication_type_target_id=959&thematic_areas_target_id=67&field_author_new_target_id=1205&field_year_value=All&field_project_target_id=1138&body_value=)

<https://itforchange.net/index.php/arriving-at-right-platform-for-e-learning>

<https://itforchange.net/index.php/democratizing-translation-using-digital-methods>

<https://itforchange.net/index.php/exploring-teacher-agency-design-of-ict-and-education-programs>

<https://itforchange.net/edtech-leviathan>

<https://itforchange.net/platform-capitalism-and-edtech>

<https://itforchange.net/national-coalition-on-education-emergency>

<https://itforchange.net/supporting-english-language-teaching-during-pandemic>

<https://itforchange.net/capacity-building-of-teachers-of-kreis-schools-on-%E2%80%9Cdigitally-enabling-schools%E2%80%9D-and-%E2%80%9Cintegrating-ict>

<https://itforchange.net/use-of-technology-and-oer-for-e-content-development-for-odl-professionals-of-karnataka-state-open>

<https://itforchange.net/online-classes-for-class-8-and-class-9-students-from-government-and-aided-schools>

### Annexure 3. List of KOER materials published

Resources created and updated by IT for change team

<https://karnatakaeducation.org.in/KOER/en/index.php/Trigonometry>

<https://karnatakaeducation.org.in/KOER/en/index.php/Circles>

[https://karnatakaeducation.org.in/KOER/en/index.php/Simultaneous\\_Linear\\_Equations](https://karnatakaeducation.org.in/KOER/en/index.php/Simultaneous_Linear_Equations)

<https://karnatakaeducation.org.in/KOER/en/index.php/Quadrilaterals>

#### **Kannada**

<https://karnatakaeducation.org.in/KOER/index.php/Special:ShortUrl/5jz>

<https://karnatakaeducation.org.in/KOER/index.php/Special:ShortUrl/26i>

<https://karnatakaeducation.org.in/KOER/index.php/Special:ShortUrl/53s>

<https://karnatakaeducation.org.in/KOER/index.php/Special:ShortUrl/28l>

#### **Science**

<https://karnatakaeducation.org.in/KOER/en/index.php/Heat>

[https://karnatakaeducation.org.in/KOER/en/index.php/Acceleration\\_due\\_to\\_Gravity](https://karnatakaeducation.org.in/KOER/en/index.php/Acceleration_due_to_Gravity)

[https://karnatakaeducation.org.in/KOER/en/index.php/Gravitation\\_Activity\\_5\\_See\\_Gravity\\_in\\_Action](https://karnatakaeducation.org.in/KOER/en/index.php/Gravitation_Activity_5_See_Gravity_in_Action)

[https://karnatakaeducation.org.in/KOER/en/index.php/Gravitation\\_Activity\\_1](https://karnatakaeducation.org.in/KOER/en/index.php/Gravitation_Activity_1)

#### **English**

[https://karnatakaeducation.org.in/KOER/en/index.php/English\\_language\\_learning\\_course](https://karnatakaeducation.org.in/KOER/en/index.php/English_language_learning_course)

[https://karnatakaeducation.org.in/KOER/en/index.php/English\\_language\\_learning\\_resources](https://karnatakaeducation.org.in/KOER/en/index.php/English_language_learning_resources)

[https://karnatakaeducation.org.in/KOER/en/index.php/English\\_language\\_workshop](https://karnatakaeducation.org.in/KOER/en/index.php/English_language_workshop)