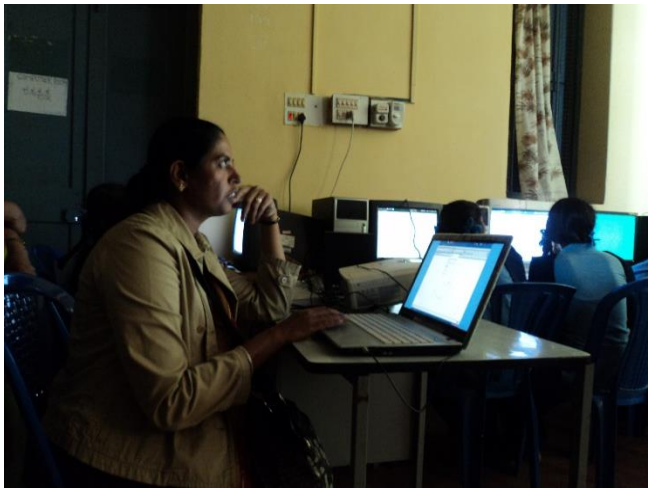

IT FOR CHANGE

SOCIAL IMPACT ASSESSMENT REPORT
Scope: April 2014 to December 2015

ABSTRACT

Cognizant Foundation's has offered a financial grant to IT for Change to provide digital teaching and learning experience for the teachers and underprivileged students studying in 16 Government High Schools in Bangalore.

Prepared by:
CSIM

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Abbreviations

BEO	Block Education Office – the primary administrative structure for school management
BRC	Block Resource Centre - block level teacher education institutions
DIET	District Institute for Education and Training - district level teacher institutions
DSERT	Department of State Educational Research and Training is the academic wing of the Department of Public Instruction
DSERT	Department of State Education Research and Training - the state equivalent institution to NCERT
FOSS	Free/Open Source Software
GIS	Geographic information system mapping
KOER	Karnataka Open Educational Resources
MHRD	Ministry of Human Resource Development
NCERT	National Council of Educational Research and Training
NCTE	National Council for Teacher Education
PHET	Physics Education Technology
RMSA	Rashtriya Madhyamik Shiksha Abhiyan - a Government of India programme for secondary education
TCOL	Teachers Community of Learning
Turtle Art	a logo based programming environment for introducing students to the basics of programming

1. Introduction

IT for Change is an NGO located in Bengaluru, India, that works for the innovative and effective use of information and communication technologies (ICT) to promote socio-economic change, from a democracy, equity, social justice and gender equality point of view. IT for Change has offices in Bangalore and Mysore as well as local operations in Yadgir, all located in the State of Karnataka. IT for Change is in Special Consultative Status with the Economic and Social Council of the United Nations.

In the area of education, IT for Change works closely with the Government schools to promote quality education amongst children belonging to the marginalised sections of the society, through its field projects that focus on teacher professional development. Teacher professional development has been universally identified as the single biggest factor affecting quality of school education.

2. History and background of IT for Change

IT for Change works for systemic change through its research and field projects. For this, it also works closely with national and state governments on policy advocacy and capacity building projects. The organization also works with national bodies in education including MHRD[1], NCERT[2], NCTE[3] and is also member of committees established by them relating to school and teacher education.

IT for Change believes that ICT can help to shape participatory and collaborative processes of learning as well as teacher professional development in education, and is concerned by the attempts to use ICT programs in schools to justify, without any basis, the privatisation of both curriculum and pedagogy in the Indian public education system.

IT for Change undertakes research aimed at gathering evidence regarding the relative performances of different ICTs in education models. The organisation engages with education policy makers through advocacy campaigns. They also work on capacity building for educators and policy makers to promote alternative, more progressive, ICT in education models. IT for Change is now working on piloting ICT integration in school processes (teaching-learning and school leadership) with individual schools through the Teachers' Community of Learning programme.

With the support of Cognizant Foundation, IT for Change (ITfC) is implementing a “Teachers' Community of Learning” project in all government schools in Bangalore South 3 Block as a 3-year programme from the academic year 2014-15. The selection of all government high schools in a block is to embed Information and Communication Technologies (ICT) into the overall educational administration processes in the education system at the block level. Working

[1] Ministry of Human Resource Development
[2] National Council of Educational Research and Training
[3] National Council for Teacher Education

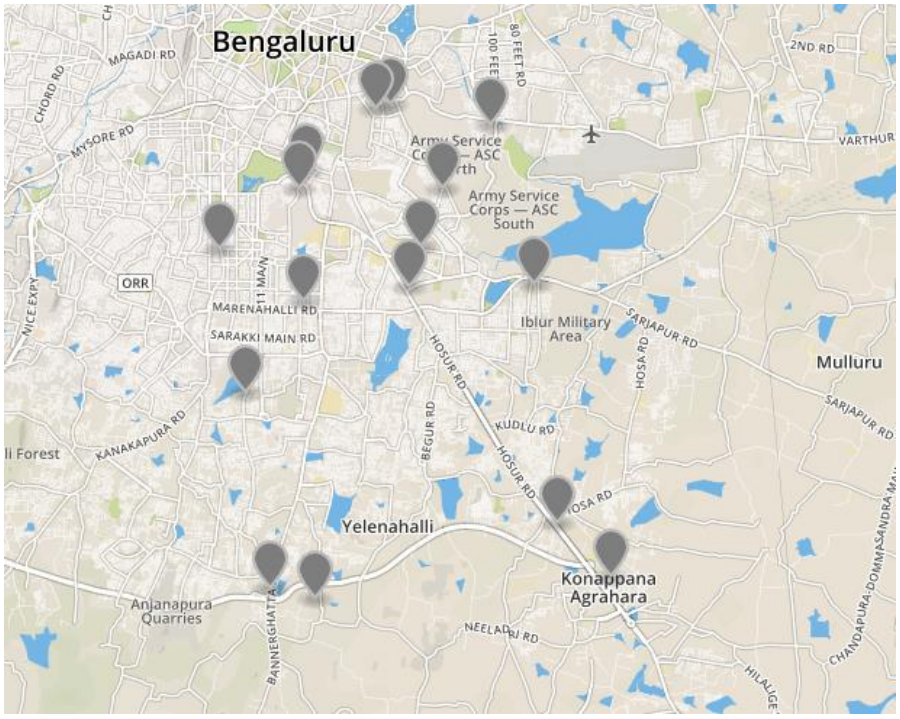
with both academic support structures (DSERT[4], DIET[5] and BRC[6]) and administrative structures (RMSA, BEO), that govern the school, can enable Teachers' Community of Learning (TCOL) to become a mainstream technology integration programme.

Governing Board Members of IT for Change

Sl.No.	Name	Designation	
1	Srilatha Batliwala	President	Scholar-Associate, Association for Women's Rights in Development
2	Geetha Narayanan	Secretary	Founder-Director, Srishti School of Art, Design and Technology
3	Gopakumar Thampi	Treasurer	Director, Economic Governance, Asia Foundation
4	Padma Sarangapani	Member	Professor, Tata Institute of Social Sciences
5	Dhanwanti Nayak	Member	Independent Researcher
6	Upendranadh C.	Associate Member	Asia Governance Coordinator, ActionAid
7	Solomon Jayaprakash	Associate Member	Founder and CEO, India Drivers Network (mGaadi)
8	Vijayabaskar M.	Associate Member	Associate Professor, Madras Institute of Development Studies
9	Michael Gurstein	Associate Member	Executive Director, Centre for Community Informatics Research, Development and Training
10	Parminder Jeet Singh	Ex-officio Member	Executive Director, IT for Change
11	Gurumurthy Kasinathan	Ex-officio Member	Director, IT for Change
12	Anita Gurumurthy	Ex-officio Member	Executive Director, IT for Change

[4] Department of State Educational Research and Training
[5] District Institute for Education and Training
[6] Block Resource Centre

Geographical Reach



IT for Change has chosen 16 Government High School for Phase 2 of the TCOL programme in South 3 Block, Bangalore Urban District. The following are the locations:

TCOL Phase 1

1 GHS Begur, Bengaluru South 3

2 GHS Thyamagondlu, Nelamangala

3 GHS Mallupura, Nanjangud

4 GHS Yadiyooru, Bengaluru South 3

5 GHPS Yadiyooru, Bengaluru South

TCOL Phase 2

1 GHS Adugodi

2 GHS Agara

3 GHS Begur

4 GHS Beretana Agrahara

5 GHS Domlur

6 GHS Ejipura
7 Ghs Yadiyooru
8 GHS Gottigere
9 GHS Jayanagar 9th Block
10 GHS Konappana Agrahara
11 GHS Madiv GHS ala
12 Nethaji Govt Hs Wilson Garden
13 GHS Puttenahalli
14 GHS Tank garden
15 GHS Vivek Nagar
16 GHS Yallagondapalya

Vision, Mission, Values and Strategies

Key Milestones

- Dec 2012 - Setting up of ICT Lab in schools and teacher orientation (Phase 1)
- Dec 2015 - Ms. Suchetha from Phase 1 school selected as state candidate for National ICT Award
- Jan 2013 - Teachers - Ms. Radha and Mr. Rajesh - from Phase 1 schools receive the National ICT award for ICT integration in teaching learning
- March 2015 -13 schools in Phase 2 have working computer labs
- Aug 2015 - Students across different Phase 2 schools start using the computer lab regularly for learning
- Sep 2015 - Assessments using ICT applications in select schools
- Feb 2016 - Launch of an Interactive Voice Response System for school-parent communication

Objective of the study

The following are the specific objectives of the study that was conducted by Marie Banu of Centre for Social Initiative and Management (CSIM):

To examine the impact of the Foundation's support in terms of funding IT for Change to implement TCOL (Phase 2) in all 16 Government High Schools in Bangalore South 3 Block, Bangalore Urban District.

This report documents the overall impact made by Cognizant Foundation's financial grant in providing digital teaching and learning experience for the teachers and underprivileged students studying in 16 Government High Schools in Bangalore.

The grant offered by Cognizant Foundation is Rs. 6,181,825.

The purpose of the grant was to:

- Support schools and teachers to learn and adopt ICTs in a variety of ways, for both their own development as well as for their teaching learning processes
- Support teachers to interact with one another, for peer learning and mentoring, within a community of learning
- Demonstrate proof of concept for an integrated model of ICT integration in teaching-learning and for school leadership
- Identify possibilities for systemic reforms and share these with policy makers
- Integrate the above into the curricular and pedagogical processes of the education system.

The study attempts to understand the extent to which the usage of the above given support has helped IT for Change achieve its mission.

The scope of the study is April 2014 – December 2015.

Stakeholders Consulted

The key stakeholders who were associated with the Social Impact Assessment Study of IT for Change were:

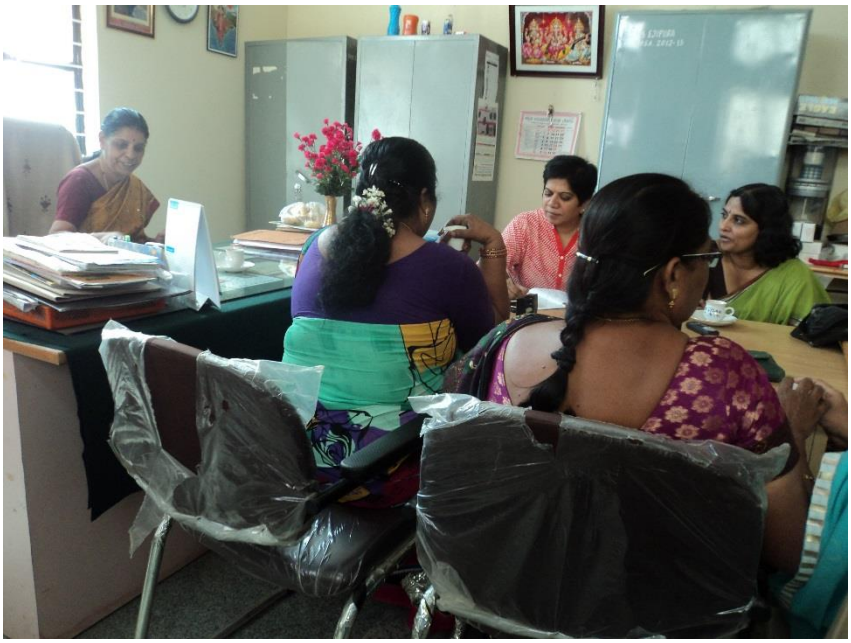
Stakeholders	Nos. Consulted
Head Master/Head Mistress	4
Teachers	38
Students	1257
ITfC Directors	2
Staff (TCOL team)	4

**Please refer Annexure 1 and 2 for detailed list of teachers and students consulted.*

The methodology of the study used was mostly qualitative in nature and both primary and secondary data were used for analysis. The study was conducted over two week period to gather first-hand information through direct interviews with key respondents

Ms. Marie Banu of CSIM visited IT for Change's Head office at Bangalore from 14th to 17th December 2015 and interacted with Head Masters/Head Mistress, teachers and students of 4 schools in Bangalore. One school at Thyamagondulu was part of Phase1 TCOL programme while 3 were part of the Phase 2 programme.

Direct interviews was conducted with Head Master/Head Mistress, and IT for Change Directors. Focused Group Discussion was used to solicit teachers and students feedback. Information was also sourced through review of documents/ records available with the IT for Change, and on its website http://www.itforchange.net/



3. Report on Performance

Integrating ICTs with mainstream teaching-learning can lead to engagement and ownership of teachers, necessary for supporting learning. This is also confirmed by research and ongoing projects with government school system, from which ITfC has developed a model of how ICTs can support and positively impact educational processes. It also helps in the professional development of teachers and creates and strengthens teacher networking and enables the practice of sharing of knowledge among them.

Teachers' Community of Learning (TCOL)

'Teachers Communities of Learning' (TCOL) as well as 'Open Educational Resources' (OER) programmes are cutting edge innovations using ICTs in education, which are recent practices in developed countries. ITfC works both in intensive (with specific schools and teachers) as well as extensive (with teachers across the entire state) modes, which complement each other.

IT for Change is implementing 'Teachers Communities of Learning' (TCOL), in Bengaluru (Karnataka) to reclaim the agency of teachers in the developing of informed and responsible citizens. It has two main objectives: (1) building a network of government school teachers, focusing on their professional developmental and motivational needs, and (2) designing and developing collaboratively digital-learning resources, using FOSS[7] education software tools.

The TCOL pilot aims to demonstrate the possibilities of ICT integration in government schools thus providing a model for adoption across the public system. This programme is being implemented in urban government high schools. The urban context can be more challenging for teachers, since the students usually come from severely marginalised socio-economic backgrounds with little or no support from home/parents for their education. The programme attempts to support teacher professional development by introducing teachers to a variety of digital methods and processes, helping them build their skills in integrating ICTs for their professional development.

Besides strengthening teacher capabilities, the project also supports the teachers in the design, planning and implementation of school-wide projects that would make interdisciplinary learning possible. Some examples of these projects include vegetation mapping, mapping of local institutions, GIS[8] mapping, mapping the neighbourhood, family map information, ICT integrated science exhibitions and demonstrations. Teachers are learning to integrate ICTs in these projects to support richer learning experiences for their students.

The TCOL project covers all 16 high schools in the Bangalore South 3 block. The aim of selecting an entire block is to better integrate the programme into the education system's mainstream curricular and pedagogical processes, working through academic support

[7] Free/Open Source Software
[8] Geographic information system mapping

structures (DSERT[9], DIET[10] and BRC[11]) and administrative structures (RMSA[12], BEO[13]), that govern the school. The project has two tracks - building a community of practitioners at the block level, and a second intensive school level programme for select schools.

IT for Change Team

Table 1: IT for Change Programme Staff details

SL#	Name of Staff	Educational qualifications	Date of joining	Role
1.	Ashok Pujari	Msc. B.Ed	July 2014	Programme Associate Supporting the Science and Mathematics programme
2.	Ananda D	MA, B.Ed	June 2015	Programme Associate Supporting the Kannada programme
3.	Radha D	BA. B.Ed	May 2014 – Aug 2015	Programme Assistant Supporting the Kannada programme
4.	Yogesh G	B.E	March 2015	Leading the tech support programme
5.	Rakesh B	Diploma in Engineering	September 2011	Tech Support for both Phase 1 and 2 of the programme
6.	Ranjani Ranganathan	MBA	May 2011	Deputy Director Leading the TCOL programme

Mrs. Ranjani Ranganathan, Deputy Director of ITfC provides leadership to the TCOL programme which involves interaction with the teachers and the students on one hand while negotiating and building alignment with the school leadership (HM) and educational administration (DIET faculty, Block Education Officer) on the other.

“The TCOL programme is about piloting ICT-integrated innovative methods of teaching, school leadership and development, thus building the school as a strong institution responsive to its community. This requires us to be sensitive to the needs of the students and their learning levels, teachers and their techno-pedagogical capabilities, as well as the Head Master's accountability to the school administration structures in terms of completion of syllabus etc. We weave our programme into the existing schedule and compulsions of the school, building the school as a community, strengthening the school-community linkages and building a community of schools. Academic knowledge, sensitivity to the contexts of the teachers, students and

[9] Department of State Educational Research and Training
[10] District Institute for Education and Training
[11] Block Resource Centre
[12] Rashtriya Madhyamik Shiksha Abhiyan
[13] Block Education Office

parents, comfort with the local language and ability to build inter-personal relationships are all critical to the effective implementation of a programme like this." —*Ranjani Ranganathan*

Table 2: No. of HM/Teachers/Students who have accessed the Digital lab

Sl #	**Name of school**	**No. of teachers** *(includes HM)*	**No. of teachers trained in digital teaching**	**No. of students**	**No. of students trained through digital learning***	**No. of computers**
1	GHS Yediyur (Phase 1)	9	4	211	Class 8	16
2	GHS Begur (Phase 1 and 2)	14	10	336	All	16
3	GHS Thyamagondlu (Phase 1)	20	10	632	All	30
4	GHS Mallupura (Phase 1)	7	5	NA	NA	10
5	GHS Agara	17	10	901	Class 8,9	28
6	GHS Madivala	16	5	595	NA	17
7	GUHS Tank Garden	10	5	294	NA	5
8	GHS Puttenahalli	9	3	339	NA	5
9	GHS Jayanagara	8	5	190	Class 8,9	16
10	GHS Adugodi	10	5	286	NA	8
11	GHS Beretana Agrahara	13	7	591	NA	16
12	GHS Konappana Agrahara	10	6	360	NA	16
13	GHS Ejipura	9	7	130	NA	10
14	GHS Domlur	10	7	159	All	15
15	GHS Viveknagar	7	2	105	NA	5
16	GHS Gottigere	9	5	360	NA	20
17	GHS Yalgondanpalya	9	1	107	NA	1
18	GHS Wilson Garden	10	5	230	NA	5

** One more school was part of Phase 1 – GMPS, Yediyur which is a primary school. With 7 computers. Mathematics and English teachers are trained and students have been introduced to basic computer literacy.*

**All means the teachers have been integrating ICT in regular teaching learning for all classes and all students are introduced to some form of digital learning*

**NA – Data not available or not applicable (in case of low number of computers)*

102 out of 197 teachers have been trained in digital teaching in 18 schools in Karnataka.

Table 3: No. of Teachers Trained

Period	No. of Teachers Trained
April 2014 – March 2015	Teachers: 80 Head Master/Head Mistress: 15
April 2015 – Dec 2015	Teachers: 40 Head Master/Head Mistress: 16

All teachers in Karnataka Government High Schools are double graduates, since they all have done B.Ed after doing a BA or BSC. Some have also pursued MA or MSc.

In the 17 schools reached through the Phase 1 and 2 of TCOL programme, 97 teachers out of 187 teachers in these schools have been capacitated to use digital teaching methodology.

In 2014-2015, from June to September and November to February months, an approximate number of 80 teachers were trained to create digital learning materials for Mathematics, Science, Social Science, Kannada and English.

A total number of 25 days of training was offered through workshops spread across 8 months in the academic year at the block as well as school level. Besides, 75 days were spent by teachers on school level interaction. 10 workshops have been organized during this period.

In 2015, from June to September and November to February, 40 teachers were trained to prepare digital learning materials for Mathematics, Science and Kannada. 15 days of training were offered to these teachers, in which 16 Head masters/Head Mistress also participated. 100 days of school level interaction was also facilitated by IT for Change. 7 workshops have been organized during this period.

Resources created by teachers

Resources created by the TCOL teachers have been uploaded on the Karnataka Open Educational Resources portal which is created using Mediawiki software. The contributions made by a teacher can be searched on this portal through a report available on the site.

IT for Change has been sharing digital resources created in workshops, accessed from the teacher training programmes state-wide as well as those created for classroom use, in Mathematics, Science and Kannada subjects.

Peer learning amongst teachers

The peer interactions amongst the TCOL teachers and with other teachers are active across Karnataka.

Teachers are competent in the following methods and models of learning

- Educational ICT tools to acquire and deepen their subject matter expertise in different school subjects – mathematics, science, social science and languages as well as in co-curricular areas, to strengthen the process of 'life-long learning'
- Internet resources for learning about both subject matter and larger educational issues
- ICT resources to improve classroom transactions, both content as well as methodology of teaching-learning
- Teacher networking portal for sharing, exchanging resources and ideas
- Internet based applications to connect to one another on a regular and on needed basis
- Email and mailing lists
- Blogs and discussion forums for sharing variety of tools and internet based resources for different educational purposes (news, encyclopedias, maps, translation tools, e-commerce sites etc.)

Table 4: National Level Resource Persons

No	Teacher	School
1	Radha Narve	GHS Beguru
2	Rajesha YN	GHS Mallupura
3	Sucheta SS	GHS Thyamagondlu

Radha Narve and Rajesh YN with dignitaries after receiving National ICT Award

Table 5: TCOL Teachers who are State Resource Persons (SRP)

No	Teacher	School	Activity
1	Saroja V Adur	GHS Adugodi	Karnataka Open Educational Resources MRP (Digital resources creation)
2	Anandakumar Y M	GHS Agara	Subject Teacher Forum MRP (Teacher training)
3	Ramachandra	GHS Beguru	Text Book committee
4	Radha Narve	GHS Beguru	Karnataka Open Educational Resources MRP
5	Mamata Bhagwat	GHS Beguru	Subject Teacher Forum MRP
6	A Manjula	GHS Beratena Agrahara	Subject Teacher Forum MRP
7	Jayanti N	GHS Dommaluru	Karnataka Open Educational Resources MRP
8	Rajesha YN	GHS Mallupura	Karnataka Open Educational Resources MRP
9	Sucheta SS	GHS Thyamagondlu	Karnataka Open Educational Resources MRP
10	Gulzar D	GHS Thyamagondlu	Subject Teacher Forum MRP
11	Padmavathi	GHS Thyamagondlu	Subject Teacher Forum MRP
12	Vatsala	GHS Thyamagondlu	Subject Teacher Forum MRP
13	Syeda Ishrath	GHS Yediyur	Karnataka Open Educational Resources MRP and Urdu medium MRP
14	Momeena Begum	GUHS Tank Garden	Karnataka Open Educational Resources MRP
15	Sarah Zakiya	GUHS Yelagondanapalya	Karnataka Open Educational Resources MRP and Urdu medium MRP

Three teachers from schools supported by Cognizant Foundation have participated in creating the National Repository of Open Educational Resources (NROER), a program of NCERT.

5 teachers serve as State Level Resource persons.

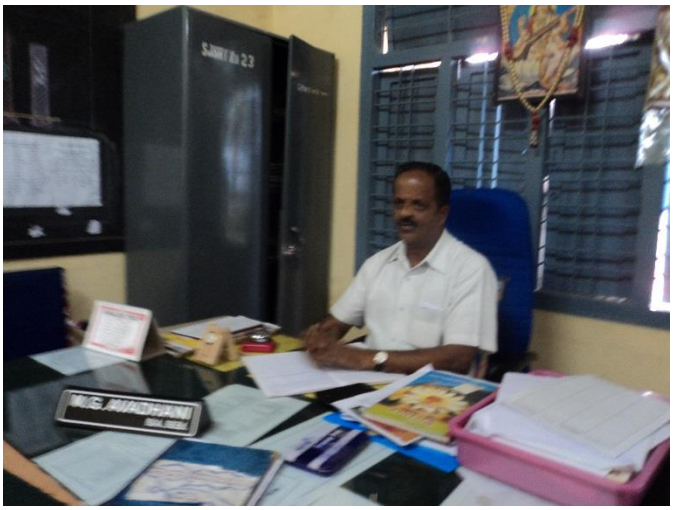
Cognizant Foundation had donated 176 de-bonded computers to IT for Change to be placed at the 16 government high schools in Bangalore. 154 are functional, while the rest needs repair.

Table 6: Status of Computer Labs

No	School	Total PCs	Total working PCs
1	GHS Adugodi	9	9
2	GHS Agara	25	21
3	GHS Beguru	18	14
4	GHS Beratena Agrahara	10	10
5	GHS Dommaluru	16	15
6	GHS Ejipura	8	6
7	GHS Gottigere	20	20
8	GHS Jayanagara 9th Block	10	8
9	GHS Konappana agrahara	8	8
10	GHS Madivala	17	10
11	GHS Puttenahalli	5	3
12	GHS Wilson Garden	5	5
13	GHS Yediyur	13	13
14	GTEHS Viveknagara	5	5
15	GUHS TANK GARDEN	5	5
16	GUHS Yalagondanapalya	2	2
	Total	**176**	**154**

4. Feedback from Stakeholders

Head Master



"There has been a change in the way we have been teaching in our school since last year. ***Teachers are getting new ideas to implement in the classroom processes and their interest in teaching has increased after IT for Change's intervention.*** *While the conceptual learning skills have been strengthened, the SSC exam focuses on writing. I would call this program successful, if the children are able to write well in the board exams and score well.*

We have very good teachers in our school and our students mostly hail from the urban slums. There is a lot of pressure from the system for syllabus completion. Hence, we are unable to deliver a quality job as we are not able to provide digital learning for all lessons. The ***pass percentage has increased from 39% in 2009 to 74.5% in 2016.***

ISKCON provides noon meal for our children. The school drop-out rate is around 10%; and we take extra efforts to meet child's family and influence re-enrolment.

I am part of the Head Masters' whatsapp group. IT for Change gave us training — from preparing salary bill to print outs—we now use computers for our administrative works. I bought a smart phone because of them.

—Mr. M.J. Avadhani, Head Master, Government High School, Domlur

"I am working as the first Vice Principal of this institution. Earlier, our school was a Composite Junior College but in 2003, our school became an independent organization. ***The school pass result was less than 80% before but today, it is 98.5%.***

We have good and experienced teachers and have 5 to 6 state level resource persons. I spend my free time with the children in the digital classroom. Earlier, we did not make much use of the computers in our school. Today, ***all school data is computerized****. From attendance, teacher schedule, students statistics—all statistics are readily available. I owe the credit to Cognizant Foundation for enabling this!"*

—Mr. Ramaiah, Vice-Principal, day 2 school (name)

Head Mistress

"I have been working here for one and a half years. There are 348 children studying in this school. IT for change has been working with our student for the last three years and their intervention has been very good. Our teachers are all well trained and are using technology in the classroom most of the time.

***I don't believe on marks alone. I feel that the students have a better understanding of the lessons now**. Twice a week, the digital classes are conducted for students studying 8th, 9th, and 10th standard.*

I am happy to say that our teachers are doing very well. I am expecting more from them! Training in Kannada and Mathematics have been provided so far. It would be good if we can involve all our teachers in training so that we have digital learning incorporated for all subjects.

Our lab has 14 computers and this is not enough for our students. A smart class can be donated to our school." ***—Mrs. Hema, Head Mistress, Begur Government High School***

"The training provided by IT for Change for our teachers has been very helpful Teachers work on digital learning materials for Kannada, Mathematics and Science subjects. Our school is located in a slum and attendance is a challenge.

To make digital learning available for all children, we need to equip our school computer lab as wiring work is pending." ***— Ujala Bhai, Head Mistress, Eijipura School.***

Teachers

"*As part of a social science project, the students were sent on a field visit to a Bank and to the local government office. Banking is a lesson in social studies and local government is a lesson in political science. Instead of just teaching the students from the text book, the teachers took an extra effort to coordinate the visits and assist them in making a video documentary. The documentary now forms part of the digital resource for the school.*

We have Tamil and Telugu speaking students and 5 among them find it very difficult to understand Kannada. Children who are weak in Kannada are not able to cope with other subjects as well. I formed three groups—good; average; and below average—and focused on the below average students which is about 20 percent of the class.

Through digital story, photo essay, and special activities focusing on alphabets and simple words, I found the learning level of these students considerably improved. *Now, I want to work on areas like reflective thinking and critical thinking as IT for Change has given us some learning materials."* ***—Mrs. Kalavathi, School Teacher, Domlur School.***

"In digital learning, Geogebra is very helpful to teach the basic mathematical concepts. We also use PHET[14], a simulation tool for Science. Last week, I used this tool to teach electro-magnetic induction and it was very helpful.

I am learning along with the students and enjoy this. Out of 6 Mathematic periods allocated per week, I use 2 for digital learning. At times, I engage the students in more than 2 digital learning classes.

The concentration level amongst students has considerably increased. But, when it comes to writing an examination, it is a challenge. They need to learn the concepts digitally and have to practice. That is the only solution! I have taught almost all concepts in geometry using Geogebra and need more training." ***—Mrs Jayanthi, School Teacher, Domlur School***

[14] Physics Education Technology

"About using theory and digital learning, I would say some classes need both. I had conducted the lesson on lenses in theory class. The children could visualize the virtual images, but could not visualize the convergence of rays even with the experiment. In the PHET simulation class, the children saw the rays converge and how images change. This made the children grasp the lesson quicker.

Some topics like chemical bonds, the theory alone would suffice. I downloaded the videos from youtube and projected it to the 9th standard students. They could comprehend well and students who can't write well can answer questions on this topic now.

I have participated in the State Level Consultation on Teacher Education Policy which was chaired by Ms. Padma Sarangapani of TISS. I am now the resource person at NCERT and I have applied for a Full Bright scholarship in the US and have been shortlisted in the India round**." —- **Ms. Radha, Teacher, Begur School

*"I started as a school teacher, and was popular in my school for using technology in classroom. I became the resource person for the TCOL block workshop and then the state level resource person for Kannada**—Ms. Mamta, Teacher, Begur School***

*"**We use the computer to prepare the question papers and study material**. Projects on Kannada lessons are worked upon and the students are able to understand the subject in an easy way now. Children enjoy learning through computers and our task of teaching has become less cumbersome."*

*"**Subject wise whatsapp group has been created at district level and all teachers participate actively**. We share the projects that we have developed and use it as a platform for exchange learning."*

Students

"In my previous school, there were no computers. Today, I am able to develop my skills as our teachers use computers to teach us. ***Attending normal classes is boring as teachers stand in front of the black board. In smart classrooms, we are able to watch videos and visualize the lessons.*** *By this, we are able to remember the lessons easily during examinations.*

Our teachers prepare lessons through power point presentations and give us projects as well. The video of how to draw human brain and human ear helped me to draw these diagrams easily. I would like to thank Cognizant Foundation as they have provided us support through IT for Change."

—Bhoomika, 10th Standard, Government Junior College, Thyamagondulu

"Smart class is very helpful as we learn many applications through Geogebra and PHET. ***In blackboard we can construct diagrams, but in Geogebra we can change the measurement.*** *Videos give us more interest to study."*

—Keshav Kumar, 10th Standard student

"I am studying in 8th standard. I learnt about Kannada poets in the digital classroom. While in a regular classroom we learn through text books, this is more enjoyable as we can visualize the lessons, learn more about the poets, places, etc."

"I can't afford to visit the places that are shown in the digital classroom. I am glad that I have the opportunity to view them here."

"I learnt Kannada lessons, about poets, places, and much more. The information taught through the digital classroom makes me feel proud of the great people in Karnataka."

IT FOR CHANGE TEAM

"After completing my Post Graduation, I used to teach for college students. I wanted to change the way of teaching and it was then I applied to IT for Change. I am happy that I got an opportunity to work here. I work along with the teachers and help them source digital resources for their classes. I relate well with the students studying the Government High Schools in Bangalore South and enjoy working here."

— Anand Devaraj, Programme Associate, IT For Change

"*I have been appointed by IFfC and my salary is supported by Domlur Senior Citizens Society, a local NGO. I was working as a computer teacher earlier, and used MS Windows, propriety software. Here, I use Ubuntu, a free software. I have two roles here: first is to help teachers to learn different technical aspects and second to help teachers work with the students.*

A lot of material on Kannada literature and poetry is available on the internet which I shares with the teachers and students. This enhances the interest in Kannada among students as they usually prioritize science and math over other subjects. I also focus on other subjects and assist the subject teachers in preparing their digital lessons.

Recently, I launched new activities like library reading time and section wise newsletters. It would be good to have digitalization of education in all school as it attracts the students and improvises learning."

—Subramanian, Computer trainer, Domlur School

DIRECTOR, IT for Change

"IT for Change conceptualised the programe of working with teachers five years ago. The idea of the programme was (unlike the traditional use of technology, where the students are taught MS office which is not connected with education) to use the real power of technology in education applications and teach children through their own teachers and not outsiders. It was a challenging task, and we went to Kerala to research on this.

We got in touch with Cognizant Foundation and in 2011 they agreed to support us to work in 5 schools. They were made more competent in ICTs. While the teachers worked well in school, the community had not progress well. One of the reason being, the 5 schools were geographically in different areas.

AS CF understood that the idea of ICT integration was working well, they agreed to support us again to work with 16 Government High schools in Bangalore South block. The HMs of these schools wanted us to focus on Mathematics and Kannada and we have a community of learning formed among this block teachers. For example, teachers have created learning material using Geogebra, access internet for videos. The classroom interaction is amazing. It is usually boring with the teacher using the blackboard and the students writing on their notebooks. But, now the teachers are engaging with the mathematical concepts and it has becoming exciting and rich.

By the end of the Phase 2 period, we would have built a community of teachers who are mutually supporting each other.

Another important aspect is replication. We have been working with the subject teacher forum for the last few years. We have formed a community of teachers at block and state level. Based on the work we have done, we have teachers who are part of a portal. TCOL contribute to this portal and are also part of google groups. Other states are now requesting us to implement this programme in their schools as well.

We hope Cognizant Foundation helps us reach more schools in a national scale."

—Gurumurthy Kasinathan, Director, IT For Change

Deputy DIRECTOR, IT for Change

"I have been working at IT for Change since 2011. Prior to this, I worked as a teacher in a private schools teaching at various levels and settings. When we started this programme, we wanted to have a community of teachers come and learn together. We also wanted to see how technology can demonstrate capabilities for learning.

Phase 1 of the TCOL programme was thought of largely a teacher capacity building exercise, and the teachers who were part of it were also part of the state wide programs where they distinguish them as key resource persons. While there was subject based tools, the focus was on building teachers' capabilities in general to work with technology and also to take them through experiences of integrated technology. Programs like mapping, digital storytelling, ICT integrated events and so on. The idea was to create an ambient condition in which teachers will start engaging with technology.

We had rich experiences and learnings from the first phase of the programme. There were also some challenges and required more intervention from our end. One of the ways we thought of addressing the issue of mainstreaming was to actually take up a block and work with all the government schools in this area. This will give a context for the teachers to interact with each other, besides the TCOL programme.

We proposed the south 3 block for Phase 2 as a natural choice as we were situated close to this. Phase 2 focus was on demonstrating in classroom what changes can happen with student learning. With this, the scope was large and we had to look at teaching learning processes in the school itself; to look at school as an institution and how it can transform itself to be a learning space for children.

There has been a lot of learnings and challenges emerging out of this. For instance, issues of migration, adolescence, child safety, and effect of media on children.

Two immediate directions that emerge is – mainstreaming digital education and looking at the entire block and see how we can bring together the community of teachers who will be taking up the responsibility of arbitrating education for the children."

— Ranjani Ranganathan, Deputy Director, IT for Change

5. Proposed Vs. Actuals

School level	
Personal digital resource libraries for teachers (in 5 topics) to help them transact better based on appropriate ICT infusion	Completed and available on Karnataka Open Educational Resources
	Digital library of specific chapters (14 lessons in Kannada; 6 lessons for Mathematics; 10 Geogebra lessons) have been completed and handed over to teachers in Domlur and Begur.
	Audio recordings of lessons have been shared with Domlur and Ejipura schools. Digital library has been developed for 6 lessons in Ejipura.
Use of ICT for students of Class 8 to help improve basic literacy and numeracy	Development of foundational materials and activities, demonstrated in class and uploaded on KOER (English) and KOER (Kannada).
	Mathematics teachers reported increase in student engagement and participation while the Kannada teacher in Domlur reported improvement in basic literacy.
	Student ICT work initiated in Jayanagara 9th Block and Agara schools.
10 lesson plans using Geogebra for Class 10 lessons	Completed for Axioms and Postulates, basic Geometric Concepts, Number Line Manipulations.
	Assessments were done using Geogebra in Begur School.
	Turtle Art lessons (developed as block level resources) were piloted in Begur as an introduction to visual programming by students
	8 lesson plans using Geogebra for Class 9 lessons were demonstrated in Domlur.
	Students have created Geogebra files.
School mapping and community mapping by Class 8 students (1 2 maps	Completed by Domlur students. The school map was appreciated by the local corporator.
	Mapping done by Jayanagara 9th Block and Ejipura school students.
Digital story telling by Class 9 students (3 5 photo/video essays)	Digital stories were done by the Class 8 and 9 students of Domlur of a bank, health centre, library, BBMP Office and the post office.
	Students of Class 8 also did story telling using digital tools as part of their Kannada lessons in Domlur and Begur Schools. Begur extended this work to include audio visual stories (language stories)
	Community digital stories were composed by students in Ejipura (Animal shelter, Police Station, Handloom shop, Bank and Post Office)
	Community interactions were documented in Jayanagara 9th block (through visits to bank, fire station, rain water harvesting plant and local businesses

Block level	
Creation of activities using Geogebra and Turtle Art (10 in each)	Resources for Turtle programming were created and shared on Courses-TurtleArt (15 lessons) and 8 lessons in Geogebra across Basic Geometry concepts. Besides, this, Geogebra lessons were developed in block level workshops
Teachers to reflect and share their experiences of (I) ICT for learning; (ii) ICT for classroom teaching-learning and (iii) participation in a forum	During block level workshops teachers articulated their beliefs and experiences to ICT integration. Two of the mathematics teachers (from Domlur and Begur) shared their experiences of ICT integration and new approaches in a State-wide workshop for mathematics teachers in February 2015 Some teachers have acquired personal laptops/ smart phones after the various workshops The mobile community of maths and science teachers is extremely active and there are at least 5-6 ideas of lessons/ activities/ resources shared every month on an average
Creation of resources for classes 9 and 10 for mathematics and science (1 per subject)	Block level workshops for mathematics and science were well attended Geogebra lessons were developed during the workshop for basic concepts and problem solving for Class 10. Lessons using simulations were developed for concepts in Physics and Chemistry. Foundational mathematics lesson sequence was developed in June and shared with all the school teachers. During a 2-Day workshop, mathematics teachers developed materials on Geogebra for Class 9 and 10 mathematics on selected lessons for Class 9-10 (about 6-8 lessons were developed) 25 videos on science experiments were shared with science teachers and they were encouraged to make lessons using the videos

6. Social Impact Map

Input indicator	Output indicator	Outcome indicator	Impact indicator
Implement Teachers Communities of Learning' in 16 schools in Bangalore	16 Government High schools In Bangalore has been reached through TCOL. 13 schools in Phase 2 have working computer labs	Increase in interest amongst teachers to deliver quality teaching by using technology	More participation during class hours and improved attendance. Resource materials created are saved in library for consequent use.
Teacher and HM training	120 Teachers and 31 Head Master/Head Mistress have been capacitated to use digital teaching pedagogy 175 days of school level interaction facilitated by IT For Change. 17 workshops have been coordinated for teachers and headmasters	Teachers have procured laptops out of their own interest to prepare the digital lessons after school hours Less stress amongst teachers as they find it easier to teach theory classes as the digital classes complement their teaching efforts	Increase in Knowledge in Mathematics and Science amongst underprivileged students. Students are scoring higher marks in their examination Ms. Suchetha from Phase 1 school selected as state candidate for National ICT Award (Dec 2015)
Donation of De-bonded computers to Government High School through ITfC	175 de-bonded computers donated to 16 High schools by Cognizant Foundation. 154 of them are functional.	Government High Schools in Bangalore South 3 Block have a full-fledged computer lab which his assessable to underprivileged urban children	Teachers Ms. Radha and Mr. Rajesh from Phase 1 schools receive the National ICT award for ICT integration in teaching learning(Jan 2013)

7. Main Achievements

- **13 out of 16 Government** high schools involved in Phase 2 of the TCOL programme have a functional ICT lab. 175 de-bonded computers donated to 16 High schools by Cognizant Foundation. **154 computes** are functional.
- **4** block level mathematics workshops have been conducted and around 20 teachers have learnt Geogebra and other tools; they are interacting with each other and sharing resources. **27** mathematics teachers are interacting and sharing resources and ideas regularly through a mobile based (whatsapp) community
- **2** Kannada block level workshops have been conducted and teachers are sharing resources.
- Resources have been developed for Bridge course and Class X topics in Mathematics and Kannada
- Introductory workshops have been conducted for Science, Social Science and English teachers
- ICT classes have been conducted for students in 2 schools and students have taken up different ICT integrated activities and projects
- ICT integrated methodologies have been demonstrated in three schools
- **Two** head teachers' workshop was conducted to introduce them to the use of ICTs for school leadership, administration as well as for teaching learning

8. Challenges

- Student context, class size and diversity makes coordinating digital learning for the current syllabus a challenge.
- Although the Schools are keen in digital teaching pedagogy, time is a constraint as the teachers need to finish the syllabus within a stipulated time frame.

9. Recommendations

- Provide support for repair or replacement for the 21 de-bonded computers which are not functional
- New or de-bonded laptops can be provided to teachers/HM for enhanced participation in the TCOL programme
- Organize inter-school competitions at district level for teachers as wells as students to promote visibility for the programme as well as creating more digital learning projects.
- Scale out the programme to more schools in sub-urban and rural areas

10. Annexures

Annexure 1: List of Teachers Consulted

Sl#	School	Teacher	Subject	Qualification	Experience
1	GHS Ejipura	Shobha J	CBZ	M.Sc. B.Ed	15
2	GHS Ejipura	M Vimala	Craft	Dip. MA	26
3	GHS Ejipura	M Savitha	English	M.A B.Ed	10
4	GHS Ejipura	Khamer Banu	Hindi	M.A B.Ed	36
5	GHS Ejipura	Ujalabai	HM, Mathematics	Bsc.Bed	30
6	GHS Ejipura	Saroja H	Kannada	M A. B.Ed	23
7	GHS Ejipura	Girija M L	PCM	B A B.Ed	7
8	GHS Ejipura	M S Suresh	PE	B.A M.P.Ed	25
9	GHS Ejipura	Sampath Kumari	Social Science	B A B.Ed	32
10	GHS Beguru	Hema	HM, Kannada		3
11	GHS Beguru	Mamata Bhagwat	Kannada	M A B.Ed	12
12	GHS Beguru	Radha Narve	PCM	Msc Bed	15
13	GHS Dommaluru	Avadani M G	HM, Kannada	BA Bed	20
14	GHS Dommaluru	Sheela Bhat	PCM	Msc. B.Ed	17
15	GHS Dommaluru	Jayanti N	PCM	Msc. B.Ed	17
16	GHS Dommaluru	Ratna T S	Science - CBZ	M Sc M A B.Ed	
17	GHS Dommaluru	Kalavati B	Social Science	M .A M.Ed	9
18	GHS Dommaluru	B T Shivaprakasha	Kannada		
19	GHS Thyamagondlu	N Thammaiah	Social Science, Head Master	BA Bed	more than 25
20	GHS Thyamagondlu	Kumara swamy C G	MA Bed	Asst teacher	21
21	GHS Thyamagondlu	Shivakumara M V	Sanskrit	MA Bed	21
22	GHS Thyamagondlu	Narayanappa D M	physical education	BA BPEd	21
23	GHS Thyamagondlu	Rebeka saiman	physical education	BA BPEd	10
24	GHS Thyamagondlu	Dinesh P J	Mathematics & Physics	Msc. BEd	11
25	GHS Thyamagondlu	Muniraj K G	Social Science English	BA Bed	34

26	GHS Thyamagondlu	Lepakshi	Social Science English	MA Bed	34
27	GHS Thyamagondlu	Premalatha G N	Social Science English	MA Bed	24
28	GHS Thyamagondlu	Suchetha S	Mathematics & Physics	Msc. BEd	10
29	GHS Thyamagondlu	Vijaya R D	Mathematics & Physics	Msc. BEd	8
30	GHS Thyamagondlu	Vathsala M	Science	Msc. BEd	10
31	GHS Thyamagondlu	Gulzar I Dambal	Science	Msc. BEd	8
32	GHS Thyamagondlu	Padmavathi H T	English	MA Bed	24
33	GHS Thyamagondlu	Bhavani S	English	MA Bed	14
34	GHS Thyamagondlu	lalithamma	kannada	MA Bed	18
35	GHS Thyamagondlu	ShivaShankar B	kannada	MA Bed	8
36	GHS Thyamagondlu	Lakshmidevamma	Hindhi	BA Bed	12
37	GHS Thyamagondlu	Arjuman Banu	Urdu	MA Bed	14
38	GHS Thyamagondlu	Ramachandrappa B K			3

Annexure 2: No. of Students interacted with

No	**School name**	**8th Std**	**9th Std**	**10th Std**	**Total**
1	GHS Domlur	45	65	49	159
2	GHS Begur	97	140	99	336
3	GHS Ejipura	49	41	40	130
4	GHS Thyamagondlu	192	241	199	632
	Total	**383**	**487**	**387**	**1257**