

# **ICT @ SCHOOL SCHEME IN TAMILNADU – AN ASSESSMENT**

**REPORT SUBMITTED TO THE MINISTRY OF HUMAN RESOURCE DEVELOPMENT**

**M. SURESH BABU & MILIND BRAHME**

**DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES, IIT MADRAS**



SMART CLASS



COMPUTER LABS

<b>Abbreviations and Acronyms</b>		
1	AICTE	All India Council for Technical Education
2	AV	Audio Visual
3	BOOT	Build, Own, Operation, Transfer
4	CABE	Central Advisory Board of Education
5	CAL	Computer Aided Learning
6	CD	Compact Disc
7	CEO	Chief Education Officer
8	CICT	Curriculum for ICT in Education
9	CIET	Central Institute of Educational Technology
10	CLASS	Computer Literacy and Studies in School
11	DCA	Diploma in Computer Applications
12	DEO	District Education Officer
13	ELCOT	Electronics Corporation of Tamil Nadu
14	ET	Educational Technology
15	FGD	Focus Group Discussion
16	HM	Head Master/Mistress
17	ICT	Information and Communication Technology
18	IITM	Indian Institute of Technology Madras
19	IT	Information Technology
20	MCA	Masters in Computer Application
21	MHRD	Ministry of Human Resource Development
22	MIS	Management Information System
23	MNC	Multi National Companies
24	MoU	Memorandum of Understanding
25	NCF	National Curriculum Framework
26	NCTE	National Council for Teacher Education
27	NRI	Non-Resident Indians
28	OMSM	Odisha Madhyamik Shiksha Mission
29	OPS	Out-right Purchase Scheme
30	PC	Personal Computer
31	PGDCA	Post-Graduate Diploma in Computer Application
32	PMEG	Programme Monitoring and Evaluation Group
33	PPT	Power Point
34	R&M	Repairs and Maintenance
35	RIE	Regional Institute of Education
36	RMSA	Rashtriya Madhyamik Shiksha Abhiyan
37	RoT	Receive Only Terminals
38	SC	Schedule Caste
39	SEMIS	School Education Management Information System

40	SIET	State Institutes of Educational Technology
41	SIT	Satellite Interactive Terminals
42	SLA	Service Level Agreement
43	SSA	Sarva Shiksha Abhiyan
44	ST	Schedule Tribe
45	TET	Teacher Eligibility Test
46	TNPSC	Tamil Nadu Public Service Commission
47	USE	Universal Secondary Education
48	UT	Union Territories

**The authors would like to acknowledge the contribution of the project staff to this report, particularly our Project Associates Dr M Govindarasan, Ms T Tamilkani and Ms K Jayashree. Their contribution to the field work as well as to the production of this report was significant.**

M SURESH BABU

MILIND BRAHME

Chennai, 27 January 2014



<b>CONTENTS</b>	<b>PAGE.NO</b>
<b>Chapter - I Introduction</b>	<b>7 - 15</b>
1.1 The highlights of revised ICT scheme	
1.2 Evaluation and Assessment	
1.3 Selection of districts for evaluation	
1.4 Justification for the selection of districts	
1.5 Locality of schools selected for ICT evaluation in Tamil Nadu	
1.6 An overview of the impact assessment framework of ICT implementation in Tamil Nadu	
1.7 The Evaluation framework	
<b>Chapter - II ICT @ School scheme: An Overview</b>	<b>16 - 44</b>
2.1 An overview of the ICT scheme in India	
2.2 ICT@ Schools Scheme: A Dynamic Model of School Education	
2.3 Organization and Administration of ICT scheme	
2.4 Agenda of the Central mission	
2.5 Mode of Implementation: BOOT Vs OUTRIGHT PURCHASE	
2.6 Central Funding Pattern	
2.7 Few Observations on the Central Scheme	
2.8 A brief note on the ICT @ school scheme in Tamil Nadu	
<b>Chapter - III ICT infrastructure in the schools of Tamil Nadu</b>	<b>45 - 52</b>
3.1 Introduction	
3.2 Implementation of the scheme	
3.3 Status of ICT implementation at the District level	
3.4 Information on Internet	
3.5 Use of Email Facility	
3.6 Website Information	
3.7 Operating Software	
3.8 Edusat Training Centres	
3.9 District Resource Centre	
3.10 IT applications for administrative functions	
3.11 MIS Report generation	

3.12 Training on ICT for Administrative Staff	
3.13 Capacity Building	
3.14 Conclusion	
<b>Chapter - IV ICT implementation in the schools of Tamil Nadu - A Quantitative Assessment</b>	
	<b>53 - 84</b>
4.1 Quantitative Assessment of ICT implementation in Schools	
4.2 Infrastructure in Schools	
4.3 Availability of ICT department, Computer Labs and External support in Schools	
4.4 ICT facilities available in Schools	
4.5 Computer networking environment in Schools	
4.6 Curriculum for ICT	
4.7 Teachers Using Technology	
4.8 ICT Teachers	
4.9 Perception of Teachers regarding ICT	
4.10 Students	
4.11 Summary of observations	
<b>Chapter - V ICT implementation in the schools of Tamil Nadu - A Qualitative Assessment</b>	
	<b>85 - 108</b>
5.1 Introduction	
5.2 Grass root response to ICT in School Education: Perspective from below	
5.3 District Progress Report	
5.4 Infrastructure: School as an ICT site	
5.5 ICT Curriculum: Going beyond computer literacy programme	
5.6 ICT educators as content developers	
5.7 ICT in School education: Interaction with Students	
<b>Chapter - VI Conclusion and Suggestions</b>	
	<b>109 - 112</b>

## **CHAPTER 1**

### **INTRODUCTION - AN EVALUATION AND ASSESSMENT OF ICT @ SCHOOL SCHEME**

## **INTRODUCTION**

The Information and Communication Technology in School Scheme was launched by the Department of School Education and Literacy, Ministry of Human Resource Development in December 2004 to provide opportunities to secondary stage students to build their capacity in ICT skills and to facilitate learning through computer aided processes. The scheme was envisaged as a major catalyst to bridge the digital divide amongst students of various socio economic backgrounds and across geographical barriers. The Scheme provides support to States/UTs to establish computer labs on a sustained basis. The Scheme was revised in July 2010 based on the previous experience.

A Committee has been constituted to draft a Policy on the usage of ICT in School Education. A draft policy has been prepared which is in the final stage. The draft policy aims at using ICT for preparing youth to compete globally and participate creatively in the establishment, sustenance and growth of a knowledge society.

The scheme currently covers both Government and Government aided Secondary and Higher Secondary Schools. Financial assistance is provided for procurement of computers and peripherals, educational software, training of teachers, development of e-content, Internet connectivity and to set up smart schools. Out of 150 smart schools that were planned, 63 smart schools have so far been approved in 12 States and 3 UTs under this Scheme

### **1.1 The highlights of revised ICT Scheme**

- The objective of the Scheme is to cover all Government and Government aided secondary and higher secondary schools by giving priority for early coverage of schools in educationally backward blocks and in areas having concentration of SC/ST/minority/weaker section population.
- Under the revised scheme, there is a provision of a suitably qualified full time computer teacher in each secondary and higher secondary school. In case of higher secondary school having computer related subjects as elective, there would be need for a teacher with post graduation in computer science or applications.



- 150 smart schools in each district would be set up by State Government and UTs at the district level using a grant of Rs. 2.5 million for a school and a recurring grant of Rs. 250,000 per year. This would enable provision of at least 40 computers in each such school.
- The non-recurring expenditure for schools has been revised in the year 2005 from Rs. 670,000 to Rs. 640,000 whereas annual recurring expenditure has been revised from Rs. 134,000 to Rs. 270,000. The recurring cost will be provided for a period of 5 years from the year of sanction.
- The sharing pattern will be 75:25 between the Center and the State except for the north eastern States including Sikkim where the ration would be on 90: 10.
- There are provisions for in-service (induction and refresher) training for all teachers in secondary and higher secondary schools to enable them to impart ICT enabled teaching.
- There is a provision to strengthen State Institute of Educational Technologies (SIETs) to contribute to e-content development. Management, monitoring and evaluation will be strengthened.
- Convergence with the existing programme would be essential especially in teacher training and ensuring reliable power supply and internet connectivity.
- The scheme includes National Award for teachers using ICT in schools in the teaching learning process.

## **1.2 Evaluation and Assessment**

The Ministry of HRD has engaged 3<sup>rd</sup> Party Evaluating institutes for the Evaluation and Assessment of ICT implementation in all the States/UTs. In Tamil Nadu, Indian Institute of Technology Madras has been appointed by the Ministry to conduct the evaluation of ICT Scheme in Schools.

### **Objectives of Evaluation**

The core objective of undertaking this evaluation is to assess the

- (a) Relevance of the project
- (b) Benefits derived from the project (Impact)

- (c) Whether benefits will continue after the project ends (sustainability)
- (d) The attainment of specific targets for key indicators (effectiveness)
- (e) The amount of effort and resource used (efficiency/ economy) and institutional development and sustainability;

The study aims to assess:

- The implementation of ICT in School Scheme and its impact on overall use of ICT in School;
- Implementation Models;
- Usage and skill levels of various stakeholders such as Students, Teachers, School Principal, DEO, State level authorities etc.;
- Impact on learning process
- ICT in School Governance

**For the purpose of this report the term “ICT @ School” refers to the scheme funded by the Central Government, wherein computers are provided to schools on a cost sharing basis of 75:25 between the Government of India and State Government.**

**The Tamil Nadu Government also has its own ICT in schools programme, which is also referred to in the state as “ICT @ School”.**

**For more details on the state government funded programme and for disambiguation, please refer to the Tamil Nadu School Education Department’s website:**

**<http://www.tnschools.gov.in/ICT-Schools.html>**

### **1.3 Selection of Districts for Evaluation**

As per the guidelines of MHRD, the Evaluating Institute was to cover a minimum of six districts in the State/UT allotted to it and if the State has more than 20 districts, 25% of the total districts may be covered. Since, Tamil Nadu has 32 districts, 8 districts were selected for evaluation considering the selection criteria given below.

**Table 1 Selection of Districts for Evaluation/Assessment**

Sl.No	Selected Districts	Selection Criteria
1	Chennai	Urban district
2	Villupuram	Rural district
3	Tiruvannamalai	District with lower tele-density
4	Coimbatore	District with high tele-density
5	Cuddalore	Urban district
6	Dharmapuri	Characterized as backward by the state
7	Virudhunagar	District with electricity problems
8	Dindigul	Medium Tele-density

#### 1.4 Justification for the selection of districts

##### Urban Districts

*Chennai* is the capital of Tamil Nadu and it is the sixth most populous city in India with 4.68 million residents. (Census, 2011). Chennai is an Urban district where there is growing number of information technology firms.

*Coimbatore* is the second largest city in Tamil Nadu and the 15<sup>th</sup> largest urban agglomeration in India with an urban population of over 2 million. It is a major commercial center and referred to as the Manchester of South India. Coimbatore is marked as a district with high tele-density.

##### Districts with Medium level of urbanization and tele-density

*Cuddalore* is one of the six districts in Tamil Nadu currently receiving funds from the Backward Regions Grant Fund Programme (BRGF), one of the country's 250 most backward districts (Ministry of Panchayati Raj, 2006). The district has urban population of 754,361 and the major urban centers are Cuddalore town, Chidambaram, Panrutti, Neyveli and Vrudhachalam town.

*Dindigul* is a district with Medium Tele-density. As per 2011 census, 62.59% population of Dindigul districts lives in rural areas and 37.41% lives in urban regions.

##### Rural districts with lower tele-density and infrastructure

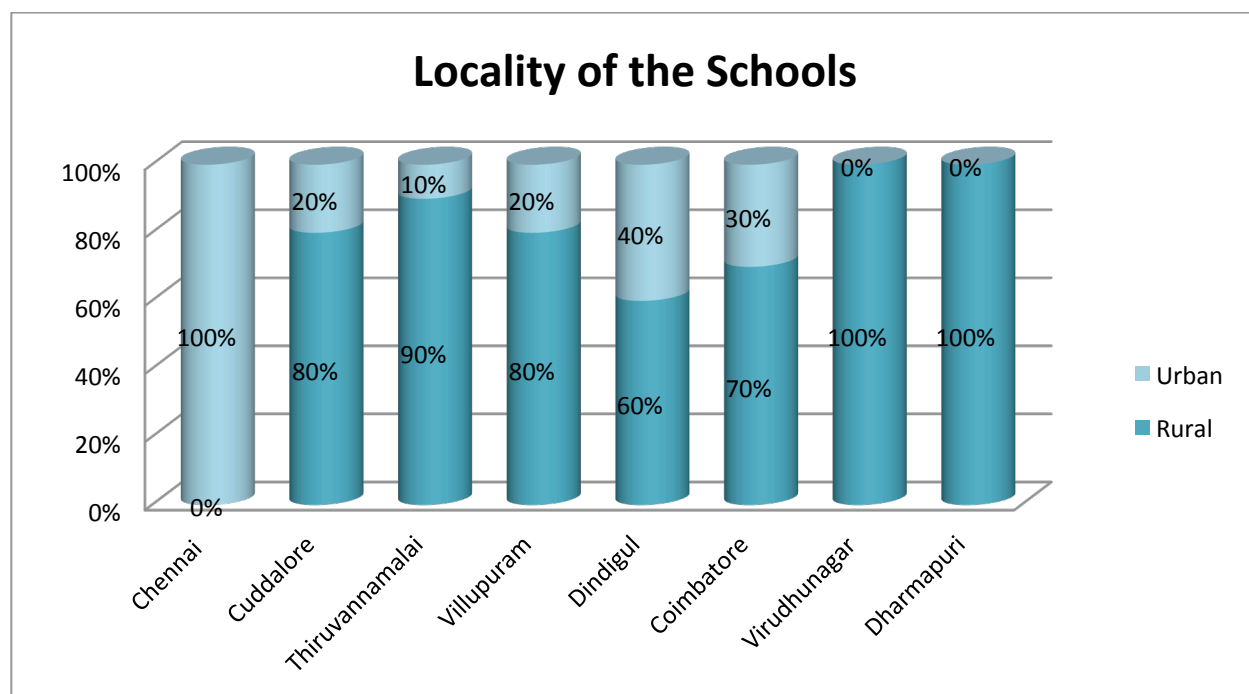
*Villupuram* is the largest district in the state. 85.28% population of Villupuram district lives in rural areas. In 2006, the Ministry of Panchyati Raj named Villupuram one of the country's 250 most backward districts (out of total 640)

*Tiruvannamalai* is marked as a district with lower tele-density in Tamil Nadu (Statistical Handbook of Tamil Nadu 2012).

*Dharmapuri* is considered as one of the most backward districts in Tamil Nadu.

*Virudhunagar* district is an administrative district of Tamil Nadu. The district has been seriously affected with electricity and power cut problems over the years.

### 1.5 Locality of the Schools selected for Evaluation in Tamil Nadu



School localities were selected based on the criteria given by MHRD. Chennai being urban district 100% Schools are from urban areas. In Virudhunagar and Dharmapuri districts, the schools have been taken only from rural areas. In the remaining districts, the Schools have been taken from both urban and rural areas.



In Cuddalore and Villupuram districts, 80% schools are from rural and 20% from urban areas. In Tiruvannamalai, 90% rural and 10% urban schools were taken. In Dindigul 60% rural and 40% from urban region, while in Coimbatore, 70% rural and 30% urban schools have been taken for evaluation.

### 1.6. An overview of the impact assessment framework of ICT implementation in Tamil Nadu

The MHRD provided the Evaluating Institute a detailed tool to undertake the Evaluation and Assessment of ICT implementation in Schools. The tool contains two parts as given below:

#### Part - I

- Information to be taken from State Level Authorities
- Information to be taken from Nodal Officer/ District Coordinators/ District Education Officers/ Inspector of Schools
- Information to be taken from Heads of Schools

#### Part - II

- Information to be taken from State Authorities
- Information to be taken from Principals/ Heads of Schools
- Questionnaire for ICT Teachers
- Questionnaire for All Other Teacher(s)
- Questionnaire for Students
- Focus Group Discussion

**Table: 1 The Evaluation Framework**

Evaluation Framework Adopted by IITM as per the guidelines of MHRD			
Respondent Categories	Type of Information Collected	Research Technique Adopted	Sample Size
<b>Principal Secretary, School Education Department</b>	Implementation, effectiveness and monitoring of the project, extent of convergence achieved and other macro issues.	Interview	One

<b>Joint Director, School Education (In-charge of ICT Implementation)</b>	Structure, functioning, management and activities of ICT in Tamil Nadu. Suggestion/recommendations regarding the lacunae in the implementation of ICT	Interview	One
<b>Chief Educational Officers</b>	Functioning of ICT at the district level, major restraining and facilitating factors in implementation, Strength and weaknesses of implementing agencies.	Interview	Eight
<b>School Principals/HMs</b>	Basic Infrastructure of the school implementing ICT, Availability and Capacity of ICT tools, Training, ICT requirements in the school, Impact of the ICT programme amongst the teachers and students. Problems and Suggestions relevant to ICT.	Questionnaire, Interview and Observation	1 HM in each School
<b>ICT Teachers</b>	Discussion on Teaching material, Curriculum, students interest, Learning capability, Practical sessions, schedule for computer teaching for various classes	Questionnaire and Interview	1 Teacher in each School
<b>Non-ICT Teachers</b>	Discussion on the trainings attended by non-ICT teachers, ICT in teaching subjects, Interest and Impact, ICT Curriculum, ICT Material, ICT	Questionnaire and Interview	4 Teachers in each School [One Teacher in each subject like

	related projects, Impact on students' performance		Science, Social science, Language, Mathematics]
<b>Students</b>	Access to use computer, Internet, social websites. Involvement in learning computers, Feedback on the introduction of ICT in learning subjects.	Questionnaire and Interview	(A sample of two students (1 Boy and 1 Girl) taken from all classes i.e. 9 – 12 in each school)

Based on the tools provided by MHRD for primary data collection, the impact assessment framework covered broad categories such as Infrastructure, Curriculum, Staff, Students and the perception of teachers regarding ICT implementation in schools.

## CHAPTER 2

### ICT @ SCHOOL SCHEME: AN OVERVIEW

#### **2.1 An Overview of the ICT Scheme in India:**

*“The ICT Policy in School Education aims at preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socio-economic*



*development of the nation and global competitiveness”- National Policy on Information and Communication Technology (ICT) in School Education, 2012*<sup>1</sup>.

Information and Communication Technology (ICT) has immense potential as a tool of social transformation and economic growth in India. The Central proposal of ICT in education merits attention in this context with its emphasis on bridging the digital divide in schools owing to geographical, economic and/or social factors. “India shows enormous geographic and demographic disparity in ICT use...One can find intense ICT use in technology clusters such as Bangalore and Gurgaon or amongst the upper middle brackets of incomes. The other side of the story is that large parts of the country lack even telephone connectivity”<sup>2</sup>. ICT@ Schools Scheme seeks to provide holistic support covering schools in isolated and remote areas of the country towards progressive use of technology in school education.

The significance of technology based education system was highlighted in the National Policy on Education 1986 (modified in 1992) that paved the way for integration of ICT in school curriculum. It had certain guidelines to implement ICT module’s at the school level. *“The policy defines ICT Literacy in terms of levels of competence. Based on the stage of schooling at which a student or teacher is introduced to ICT, they may progress to different levels. These levels are suggestive and adaptations must be made to suit local conditions. The levels do not correspond to specific classes (for e.g. sixth or seventh standard) and time duration must also be locally determined. Also, these levels must be revised periodically to keep pace with changing technology”- National Policy on Information and Communication Technology (ICT) in School Education, 2012*<sup>3</sup>.

Educational Technology, ET (1970s) & Computer Literacy and Studies in School, CLASS (1980s) were the founding measures towards the formulation of a comprehensive ICT@ SCHOOLS SCHEME in 1990s. As early as 1998 the IT Task Force<sup>4</sup> inducted a series of steps in strengthening ICT system of education. The recommendations of the taskforce focused on infrastructural and financial arrangements that would be made as components of the ICT package. It was to impart confidence to

---

<sup>1</sup> <http://www.itforchange.net>: Department of School Education and Literacy, Ministry of Human Resource Development, Government of India. Last accessed 20.9.2013.

<sup>2</sup> <http://siteresources.worldbank.org/INTEDEVELOPMENT/Resources/Guidelines.pdf>: ‘Information and Communication Technology @ Schools’ Last accessed 23.9.2013.

<sup>3</sup> <http://www.itforchange.net>: Department of School Education and Literacy, Ministry of Human Resource Development, Government of India. Last accessed 20.09.2013.

<sup>4</sup> National Task Force on Information Technology and Software Development.

schools that showed interest in Vidyarthi Computer Scheme, Shikshak Computer Scheme and School Computer Scheme suggested by the IT Task Force. The Task Force recommended supply of computer to all Higher Secondary/Secondary schools within five years as a first step towards propagating ICT in school education. Further, the following components were also added in order to motivate the schools to take up ICT based model: a. Supply of PCs at nominal or subsidized rates; b. Facility of bank loans in easy installments; c. Arrangements for computer donations from NRI organizations, MNCs and IT companies.

CLASS and ET were integrated to lay the path for a comprehensive ICT in school education. *“This scheme is not a simple merger of the earlier CLASS and ET Schemes but is a comprehensive and well thought-out initiative to open new vistas of learning and to provide a level playing field to school students, whether in rural areas or in the metropolitan cities”*<sup>5</sup>. Presently, the progress of ICT scheme is under different stages across states. Both advanced states like Kerala, Tamil Nadu and developing states like Odisha, Madhya Pradesh, are making strides in technology based education. Interestingly, the backward states are eyeing this programme as a tool of development in socio-economic terms.

### **Box 2.1: ICT in an Expanding Phase in Secondary Schools of Odisha**

#### **4,000 secondary schools to get computers<sup>6</sup>**

The Computer teachers will be appointed in the schools. Odisha Madhyamik Sikhya Mission

<sup>5</sup><http://siteresources.worldbank.org/INTEDEVELOPMENT/Resources/Guidelines.pdf>: ‘Information and Communication Technology @ Schools’ Last accessed 23.9.2013.

<sup>6</sup><http://newindianexpress.com>: Last accessed Monday, September 23, 2013.

(OMSM), the executing body for the scheme, has decided to provide additional equipments like projector and whiteboard besides facilities like generator, online UPS and stabilizers.



**The New Indian Express, May 18, 2013**

As ICT is a phased programme which has seen prior experiments with computer based curriculum in schools, a bird's eye view of the early models is presented below to understand the trajectory of the comprehensive scheme.

## **2.2 Experiments with ICT in Schools: Earlier Versions**

This report deems a discussion on earlier versions essential as they had laid the path for ICT scheme of 1990s.

**Educational Technology (ET):** A fourth plan component, this pioneering proposal of 1970s roped in the participation of State Institutes of Educational Technology (SIET) and states/UTs towards procurement of audio-visual equipments<sup>7</sup> with 100% financial assistance to 6 SIETs. This programme is seen as a precursor to the visual medium of presentation and AV sessions, an important component of the present day ICT scheme.

**Computer Literacy and Studies in School (CLASS):** A pilot programme in 1984-85, CLASS initiated the use of computer technology in Government schools through the first step of distribution of BBC micro-computers. It saw subsequent expansion as a Central scheme during the eighth plan, 1993-98. Mission of this intervention was to assure (financial & technical) supply and maintenance of computers in Government & Government aided Secondary & Senior Secondary Schools. Nearly 2598

---

<sup>7</sup> Radio cum cassette players, Colour TVs.

schools under CLASS scheme were identified for the Central support that included hardware maintenance, materials for students and training for the teachers. It may be noted that CLASS scheme defined ICT as a holistic intervention which had to go beyond computer supplies.

**Smart Schools as Technology Demonstrators<sup>8</sup>** : The agenda of SMART SCHOOL that evolved in 1990s was to serve as a model ICT school that would share its resource base with local schools with the objective of promoting adoption of technology in curriculum as well as the classroom process. Complete computerization of one section (of 40 students) with required amenities in each year, i.e. class IX-XII, was the target. By definition, *“a school having 160 computers @ 40 computers for each IX to XII classes may be called a smart school...”* (MHRD)<sup>9</sup>. Financial allocation to the tune of Rs.25 lakhs per smart school was assured by the Central Government. In addition, specific allocation to the tune of Rs. 2.5 lakhs was assured towards recurring expenses that included maintenance and monitoring costs. It was proposed that training in local language would be arranged based on the demand from the beneficiary school. Monitoring and management of smart schools was entrusted to an Advisory committee consisting of the principal of the mother school and the principals of participating schools. It is apparent that the proposal of smart schools aimed at fostering grassroot linkages among local schools and the community at large.

---

<sup>8</sup> The term “Technology Demonstrators” is drawn from MHRD referring to the role of smart schools. [http://mhrd.gov.in/ict\\_school](http://mhrd.gov.in/ict_school) ‘Overview on ICT’. Last accessed 23.09.2013.

<sup>9</sup> <http://www.teindia.nic.in>: ‘Revised ICT@ Schools Scheme’ Department of School Education and Literacy, Ministry of Human Resource Development, Government of India. Last accessed 23.09.2013.

## Box 2.2: Smart session in a Tamil Nadu Government school<sup>10</sup>

**New Age Classrooms:** Information Technology Minister (Government of Tamil Nadu) operates an interactive board at the e-smart classroom launched at the Government Higher Secondary School in Virudhunagar district. In an e-smart classroom, the teacher uses an interactive electronic board, supported by a computer, to teach subjects with the help of 3D images and animations.



- *The Hindu*, July 30, 2010

<sup>10</sup> <http://www.thehindu.com/>: Last accessed 20.9.2013.

## 2.2 ICT@ Schools Scheme: A Dynamic Model of School Education

### Policy Preamble:

*“Begun in 2004, the ICT @Schools scheme primarily aims at catalysing the process of infusion of Information and Communication Technologies supported practices, which in turn will enhance productivity, efficiencies, and an equitable access to education to all” – MHRD (2010)<sup>11</sup>.*

The objective of ICT scheme is essentially to enhance the quality of school education. Creation of a knowledge society is considered to be a vital step in the process of nation building. The objective is sought to be achieved through *“optimal utilization of and optimum returns on the potentials of ICT in education”* (MHRD, 2012)<sup>12</sup>. Thus the ICT policy was drafted with the following goals:

- Availability and accessibility of ICT tools in school free of cost by all so as to enhance its academic usage for works of teaching-learning, research and evaluation.
- Development of the ICT skills among teachers & students so as to foster their application in schools.
- Promotion of collaborative endeavors so as to induce community participation in ICT based assignments
- Creation of professional networks with a view towards improving efficiencies in the teaching-learning processes.

### 2.2.1 Four Core Components of the Scheme: Towards Establishment of ICT Schools

The Central Government proposed to make computer-aided education mandatory in all Secondary and Higher Secondary Government and Government aided Schools. To initiate ICT programme in schools, four steps were undertaken:

- Partnership with State Governments and Union Territories

---

<sup>11</sup> [www.mhrd.gov.in](http://www.mhrd.gov.in): ‘Guide for Implementation of the ICT@ Schools Scheme & Model Bid Document’, Department of School Education and Literacy, 2010.

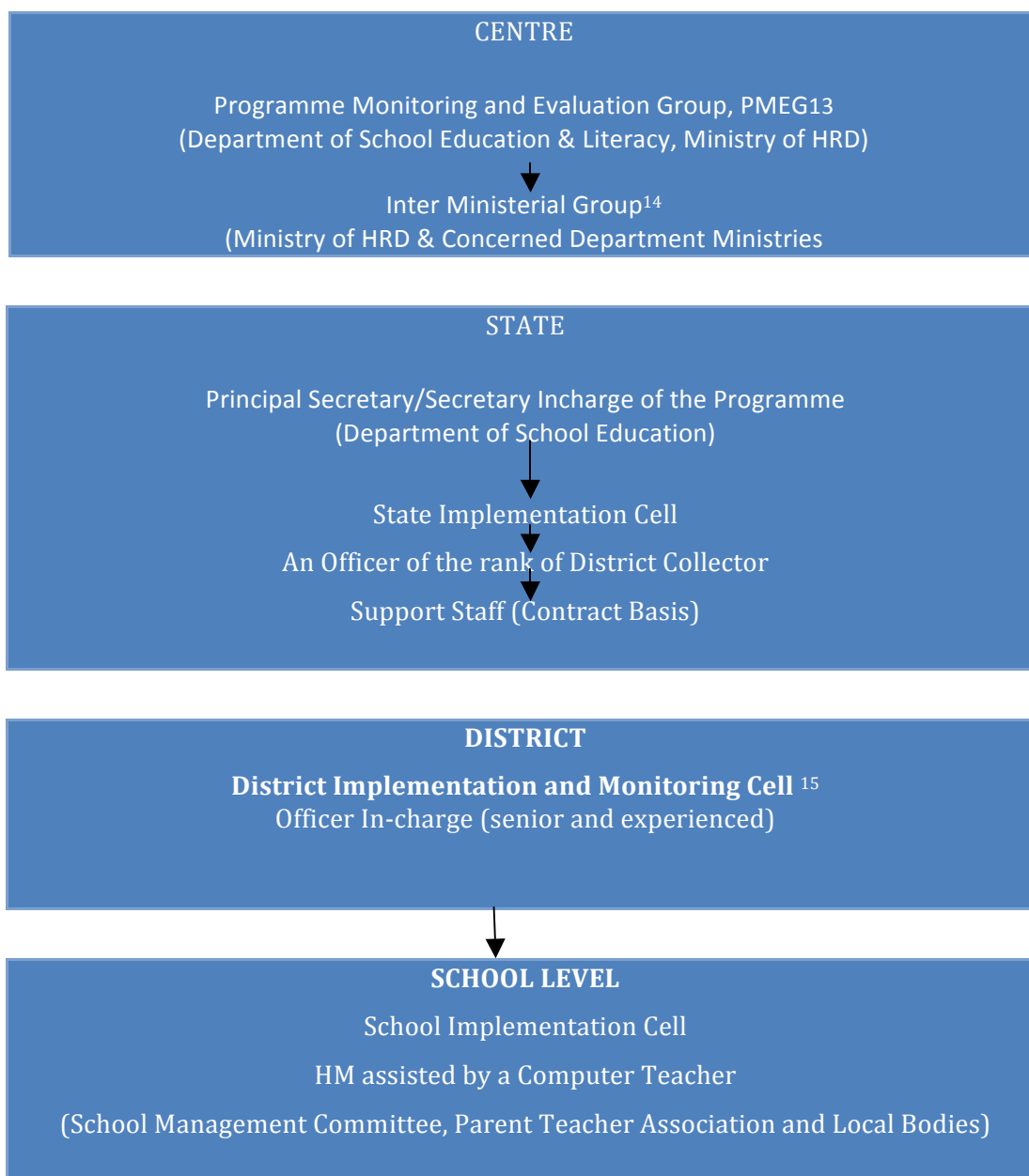
<sup>12</sup> <http://www.itforchange.net>: Department of School Education and Literacy, Ministry of Human Resource Development, Government of India, 2012.

- Functioning of smart school as model ICT school
- Capability enhancing programmes for teachers
- Impetus on e-content through CIET, SIETs, RIEs alongside outsourcing arrangements

### **2.3 Organization and Administration of ICT scheme**

For effective functioning of the scheme there are governing bodies at all three levels – Central, State and District – who are assigned with the tasks of co-ordination and implementation, monitoring and supervision of the scheme. These agencies would attend to the requirements and grievances of school functionaries through their subordinate units. For instance, the school level programmes would be co-ordinate by the State department through the offices of CEOs and DEOs. The levels of administration are presented in Chart 2.1.

**Chart 2.1: Organizational Structure of ICT@ Schools Scheme**



## 2.4 Agenda of the Central Mission

<sup>13</sup> PMEG oversees the implementation of the scheme in schools across states. One of its primary tasks is to form task groups that would invite the suggestions of individuals (professionals)/institutions for effective implementation of the programme in states. The PMEG led taskforce calls for “norms, specifications, guidelines, evaluation reports, white papers etc., to guide the states in implementing the ICT programme (National Policy on Information and Communication Technology (ICT) In School Education, MHRD, 2012).

<sup>14</sup> This Group comprises of members from various ministries including that of Communications and Information Technology, Ministry of Information and Broadcasting, Ministry of Labour, to mention a few, alongside those from MHRD. The Group, like the PMEG, is also an important body which has the responsibility of guiding the implementation in terms of choice of appropriate technology and periodic assessment of ICT education system.

<sup>15</sup> The officer of will be responsible for the implementation of the scheme in the schools (Secondary & Higher Secondary) at the district level. This cell also has to undertake the task of maintaining and forwarding reports to the Ministry.



Three important areas were identified in order to complement the existing model – the chalk & talk method with ICT based education. They are: a. School Curriculum; b. Staff Training; c. ICT Infrastructure.

### 2.4.1 School Curriculum

At the policy level, an ICT-based curriculum was envisaged as a tool of self-learning that was supposed to enhance the quality of education. This has been emphasized in national education frameworks like National Curriculum Framework (NCF) 2005, Sarva Shiksha Abhiyan (SSA), and Central Advisory Board of Education (CABE), Universal Secondary Education, 2005. To quote the National Policy on ICT in School Education (2012), “*ICT enabled teaching-learning encompasses a variety of techniques, tools, content and resources aimed at improving the quality and efficiency of teaching-learning process*”<sup>16</sup>. So, in a larger sense, ICT scheme intends to make learning an enriching experience through virtual sessions and multi-media modules. It is interesting to note that EDUSAT programmes were proposed to be timetabled in the school curriculum.

#### Box 2.3: Satellite classes: ET in Remote Schools<sup>17</sup>

##### Satellite Classes

EDUSAT can provide connectivity to schools, colleges and higher levels of education and also support non-formal education including developmental communication.

The nation-wide beams are being harnessed by agencies like IGNOU, NCERT and the All India Council for Technical Education (AICTE), to reach hundreds of Receive Only Terminals (ROTs) and Satellite Interactive Terminals (SITs) located in schools and colleges, many in remote areas.

Content generation is the responsibility of user agencies, but it is a matter of concern that, nearly four years after the satellite was launched, much of its capacity is lying idle - Sajan Venniyoor, Community Radio Forum of India / Prasar Bharati

The ICT curriculum was drafted to cater to the needs of the specific groups:

<sup>16</sup> <http://www.itforchange.net>: Department of School Education and Literacy, Ministry of Human Resource Development, Government of India, 2012.

<sup>17</sup> <http://www.itforchange.net>: ‘The promise of educational radio’ Short Discussion Paper, Consultation on ‘National Policy on ICTs in School Education’, New Delhi, April 29th-30th, 2008. Last accessed 23.9.2013.

- As an integrated academic module in schools covering students of classes 1X – XII;
- As an elective course in software applications at higher secondary levels;
- As an vocational course in data processing, desktop publishing and office automation;
- As an inclusive curriculum to cater to the needs of children with special needs as per Web Content Accessibility guidelines.
- As an open and distance learning programme so as to bring back drop outs and support students under non-formal stream.
- As an integrated academic module for higher secondary students, the system intends to develop the computer skills of students in three stages<sup>18</sup>.

**Basic Level:** Getting trained in fundamental computer operations – word and data processing works, connect/disconnect operations and web operations; management of external devices like sound recorders, cameras and scanners.

**Intermediate Level:** Getting proficient in software applications, digital works and installation processes; locating, retrieving and management of content and resources.

**Advanced Level:** Gaining competency in presentations, research and web based projects; awareness on cyber security and copyright issues.

In order to develop the ICT skills of the students, it was formulated as an integrated academic module which would follow the Curriculum for ICT in education (CICT) proposed to be nationally designed and that could be modified by the state machinery according to its requirements.

It is essential to keep in mind that ICT in teaching-learning process requires the teacher to upgrade herself to the advanced level of application to be a role model to students.

#### 2.4.2 Staff Training

---

<sup>18</sup> <http://www.itforchange.net>: National Policy on Information and Communication Technology (ICT) in School Education, Department of School Education and Literacy, Ministry of Human Resource Development, Government of India, 2012.

An ICT educator has to don multiple roles in a technology based environment and selection and training of teachers is a vital component of the ICT scheme. To quote the policy requisite on teacher engagement:

*"...a dedicated computer teacher would be required for every secondary or higher secondary school in the same manner as a separate teacher is required for every other each subject at the secondary and higher secondary stage. Wherever higher secondary and secondary schools are combined, a PGT in IT/ computer science may be appointed to teach the IT related elective subject in the higher secondary stage and also to teach computer literacy in classes IX and X as well. In case of high schools without higher secondary stage, an IT teacher may be appointed on contract basis or through provisioning under 'BOOT model' "19.*

Capacity building of the school level functionaries – HMs, ICT teachers and non-ICT teachers is one of the key components of ICT programme. The training module is classified as follows: (a) In-service teacher training; (b) Pre-service teacher training and (c) Training for school heads.

Under In-service programme, there is a 10 day (8 hours/day) induction course and 5 day (8 hours/day) refresher course. The induction training led by RIEs, SCERTs (any State or Central institute) will not merely impart computer knowledge to the teachers for academic applications, but would be followed by a self-evaluation session so that the teachers are convinced of their ICT capability. The refresher programme follows a periodic roster so that the teachers can regularly update their knowledge and skills.

Pre-service training (55 hours) creates awareness among the teachers on the significance of ICT and initiates them into a technology based environment in school. The teachers also gain expert guidance in the NCTE curriculum (National Council for Teacher Education) and get trained in academic applications of technology.

Under the school head training programme, the school heads are to be imparted adequate training on comprehensive applications of ICT in the school including maintenance and use of digital repositories. The school heads are the deputed heads in charge of School Education Management Information System (SEMIS). It is their responsibility to create the ICT environment in school and

---

<sup>19</sup> <http://www.teindia.nic.in>: 'Revised ICT@ Schools Scheme' Department of School Education and Literacy Ministry of Human Resource Development, Government of India. Last accessed 23.09.2013.

look into relevant aspects of scheme implementation including safety and security arrangements alongwith optimum utilization of ICT facilities by the teachers and the students.

In order to encourage innovative applications of computer technology, the Central Government has allotted a sum of Rs.1.40 crores towards National Award for the Teachers.

**Box 2.4: Central Induction Training Schedule<sup>20</sup>**

---

---

Structure of the 10 - Day Induction Programme on ICT in Education

10-Day Induction	Session Theme	Demo Topic	Session Theme	Demo topic
Day 01	CWW - 01	Introduction to the ICT course How to access a web page and navigate	CWW -02	Searching and downloading information
Day 02	CWW-03	Accessing and managing resources (text, images, pictures)	CWE - 01	Email Email services
Day 03	CWW-04	Accessing resources and managing (Audio and video files)	CWE-02	Email forums
Day 04	CWW - 05	Transacting through internet	IWICT - 01	Connecting to internet (hardware)
Day 05	CWW-06	Sharing information (Blogs)	IWICT -02	Storage devices
Day 06	Eval - 01		IWICT -03	Connecting different peripherals
Day 07	CWICT - 01	Processing text	CWICT - 02	Combining different resources in a single document
Day 08	CWICT - 03	Working with spreadsheets	PIE -01	Open educational Resources
Day 09	PIE - 02	Content representation	ROBD 01	Open for suggestions
Day - 10	Eval - 02		Exhibition	
CWW	Connecting with the world			
CWE	Connecting with each other			
IWICT	Interacting with ICT			
CWICT	Creating with ICT			
PIE	Possibilities in Education			
ROBD	Reaching out and bridging divides			
EVAL	entails a test, a portfolio of all work done during the course and assignments			

### 2.4.3 ICT Infrastructure

The success of ICT scheme depends to a larger extent on the arrangements made by the school towards on-site support, both hardware and software.

### Box 2.5: Technology friendly environment in ICT schools <sup>21</sup>

The Hindu 03/09/08

## Hardware clinics for school computers

**IT@School project's idea may save lakhs of rupees for the government**

**Staff Reporter**

Thiruvananthapuram: The IT@School project is setting an example through its hardware clinics. By repairing damaged computers in high schools in the State, the clinic may save lakhs of rupees for the government.

The clinics prove to be a boon to hundreds of government schools which lack expertise and money to get the computers repaired.

The project decided to start the clinics as part of its scheme to give broadband connectivity to the high schools. The clinics will be held in two places in each educational district. The school authorities can get the computers repaired then.

A three-day clinic began at the Government Model Lower Primary School here on Tuesday. Nearly 250 damaged computers from schools in various parts of the district were brought for repairs.

"We conducted a detailed survey in November last year to assess the IT infrastructure in high schools. We found that almost 5,000 computers available in the schools were not functional. Half of them were completely damaged, while the others could be repaired and revived," said K. Anwar Sadath, Executive Director, IT@School.

The IT@School project is bearing all the expenses for the repairs.

The clinics use the parts of damaged computers to train school IT coordinators in hardware.

With this, the project aims to build up expertise in schools to maintain and repair computers in their computer labs. Fifty-two master trainers will train the 2,400 coordinators by September-end.

"So far, maintaining computers used to be a big problem for government schools such as ours. But with the hardware training, we will be able to partly solve the problem ourselves," said Akhilesh K., teacher in Government High School, Paruthipally.

Mr. Akhilesh came to the clinic with five damaged computers.

An Internet mobile training will soon follow for the coordinators. By November-end, they will train other teachers back in their schools.

"We are expecting to launch Internet-based training for students in high schools by December this year. BSNL (Bharat Sanchar Nigam Ltd.), which is providing broadband connectivity, have covered 70 per cent of the high schools in the State already," Mr. Sadath said.

"We are planning to provide laptops to 1,016 government high schools by the year-end using funds from the Rs. 50-crore central assistance we received last year under the School ICT (Information and communication technology) scheme."

He said IT@School was planning broadband connectivity for higher secondary and vocational higher secondary schools in the State by January and in upper primary schools by the next academic year. This would be done using the Rs. 163-crore central assistance IT@School received in 2008 under the ICT scheme.



**KING IT:** Technicians attend to computers at a hardware clinic jointly organised by Keltron and the IT@School project in Thiruvananthapuram. - PHOTO: S. MAHENDRA

The technical support under ICT scheme includes both hardware and software packages. The components of the two are highlighted below:

#### Hardware support covers:

- Lab environment (multiple systems in one location)
- Distributed environment (like office room with 1 or 2 systems in each location)
- Mobile environment ( use of laptops to facilitate sessions outside the classroom)

#### Software support includes:

- Operating systems like windows or linux.
- Data creators/managers like word processors, browsers & e-mail clients.
- Digital content containers like web repositories, on-line libraries.

### BOX 2.6: Sampoorna Software: An inspiring initiative of the Kerala Government<sup>22</sup>

<sup>21</sup> <http://www.stockholmchallenge.org>: Last accessed 23.9.2013.

<sup>22</sup> <http://www.kerala.gov.in>: IT@ School Project: Last accessed 23.9.2013

“One of the major e-governance initiatives being rolled out by IT @ School Project is the SAMPOORNA School Management Software which is being implemented in all schools in the State. The application is intended to be a comprehensive database of students and teachers of all schools in the State, which could facilitate implementation of various educational activities of the schools, the authorities and even the State and Central Government. Various cumbersome processes such as preparation of Transfer Certificate, copying of Admission register, time table preparation, generating various reports related to students, parents, teachers etc. would be made easier using the online software”.

## **2.5 Mode of Implementation: BOOT Vs OUTRIGHT PURCHASE**

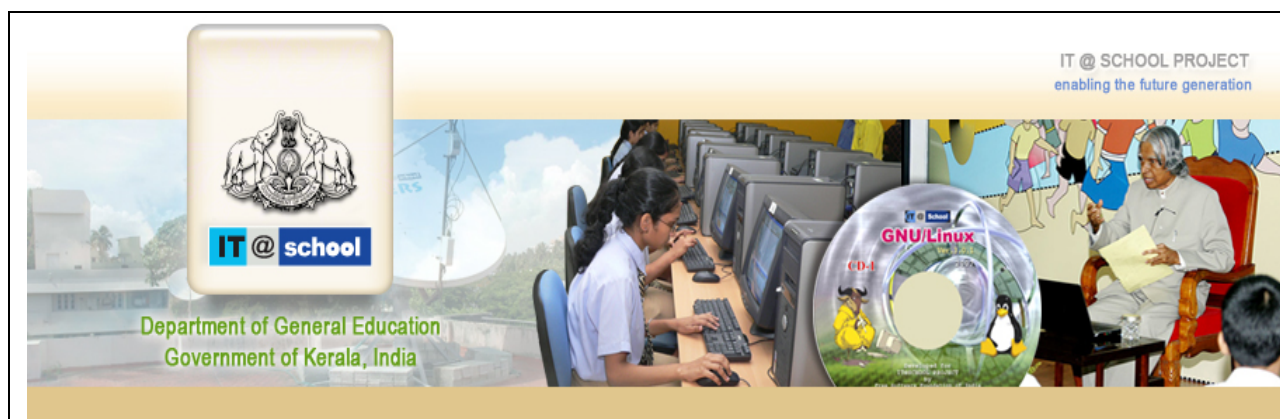
BOOT is essentially a turnkey model. As the acronym - Build, Own, Operate, Transfer - suggests, an agency is selected through bid system to supply the ICT technical support & infra for a contract period of 5 years. Towards the end of the contract period, the onus of implementation is shifted to the school. The central allocation is dispersed over the tenure. BOOT is generally the exercised choice as schools do not have the know-how to execute/maintain the ICT systems in the initial stages. Project management is the administratively preferred task of the state during the starting phase. Also financially, BOOT seems viable as the phased payment system (spread over the contract period) ensures grant sanctions to support many schools at the same time.

Under Outright Purchase system, the state procures the required infrastructure directly from the manufacturer/authorized dealer and shoulders all other ICT- related tasks by itself. It manages all components of the ICT programme including maintenance and upkeep.

States with the ability for upkeep of infrastructure throughout its life time may opt for Outright Purchase. To adopt Outright Purchase, first, alternative mechanism should be established “*to roll out each of the components of ICT programme*”, as the Model Bid guidelines stipulate (MHRD, 2010). Second, active and responsive monitoring machinery should be in place to cater to school specific requirements.

Thus, choice of the mode is one of the crucial aspects of ICT programme. Kerala is a case in point.

## Box 2.7: Kerala Mode of Implementation<sup>23</sup>



### Technical Committee and its Involvements

The Government vide G.O(Rt.)5120/2007/G.Edn., Dated 9/11/2007 has authorized the Director of Public Instructions (DPI) to constitute a technical committee to centralize the price, specification, quality and service conditions of computer and hardware/software purchase to schools.

The Technical Committee appointed vide Order No.NEP-3/80281/07/DPI of the DPI dated 07.12.2007 was the monitoring body for Price and implementation strategy of the Scheme. The Technical Committee's identified Keltron as service provider, based on condition that the purchase will be made transparent ensuring the participation of Technical Committee at every purchase process adopted by Keltron regarding this supply.

The Technical Committee has monitored and decided on the specification and rates of the items to be supplied.

Once the mode of implementing the scheme is decided, Service Level Agreement (SLA) is made. SLA enables the school to rectify the technical faults and address its infrastructural needs that

<sup>23</sup> <https://www.itschool.gov.in/ictschoolscheme.php>: Last accessed 20.9.2013



otherwise may hamper computer applications in school. It is thus a binding on the service provider to render on-call duty and becomes the responsibility of the state to supervise the functioning of the agency. It is interesting to note that the agreement is comprehensive outlining the core areas of work including civil, electrical and IT work on one hand and non-technical components like facilitating the selection process of appointing ICT educators on the other.

**Box 2.7: SLA: A Formal Means to Address Deficiencies in ICT Schools**

<b><u>Service Level Agreement</u></b>
This agreement made this ..... day of .....
between the State of _____ on the one part, hereinafter referred to as the State, the Principal / Head Teacher of _____(name of school) on the Implementation of the ICT@ Schools Scheme: Model Bid Document 23 second part, hereinafter referred to as the School, and Shri / Smt .....of M/s .....
.....hereinafter referred to as the Contractor (which expression shall unless excluded by or repugnant to the context be deemed to include his/ her heirs, executors, administrators and legal representatives) on the third part.
Whereas the State has called for Contract for the implementation of the ICT programme (replace with appropriate title if different) vide letter No..... dated .....and the Contractor has submitted a bid dated ..... for a sum of Rs ....., which has been accepted by the State vi de notification.....dated .....whereunder the Contractor has made a security deposit of Rs ____ (Rupees ____ only) as per letter No. _____, dated ..... and execute the agreement.
<i>“Now it is hereby Mutually Agreed and Declared by and between the Parties Hereto as Follows: The State shall provide along with the Work Order, a document explicitly defining the deliverables, time schedules for activities, conditions, check lists for compliance, and list of officials of the State responsible for different components of this contract.</i>
<i>The Contractor shall accept this document and return a signed copy of the same as proof of acceptance within __ days of the issuance of the work order” (Implementation of the ICT@ Schools Scheme: Model Bid Document<sup>24</sup>).</i>

**2.6 Central Funding Pattern**

<sup>24</sup> [http://mhrd.gov.in/ict\\_policy\\_doc](http://mhrd.gov.in/ict_policy_doc): Last accessed 25.09.2013.

Financial support to the Scheme by the Central Government is at two levels:

One is funding the State Governments/Union Territories with allocations for recurring and non-recurring expenditures;

Two, the assistance assured to CIET/ SIETs/RIEs and other institutes towards curriculum development.

As a Centrally sponsored scheme, the contribution of Union Government is substantial at 75% with the balance 25% to be provided by the State Governments/UTs. The Centre-State ratio is fixed at 90:10 for North East States like Sikkim. The GOI support to the States/UTs covers both capital and recurring expenditures. The components of the costs along with specific allocation for them are given in Table 2.1.

**Table 2.1: Central Assistance to States/ UTs for ICT infrastructure in each school<sup>25</sup>**

<b>a. Capital Expenditure (Non-recurring)</b>	<b>Amount (in thousands)</b>
1. 10 PCs (or one Server with 10 Terminals), 1 Projector, 1 Printer, 1 Scanner, 1 Web Camera, 1 modem, Broadband antenna, Generator/ Solar Package, UPS, video camera, etc.	510,000
2. Operating System & Application Software	20,000
3. Educational Software and CD ROMs	45,000
4. Furniture	25,000
5. Induction training in ICT to teachers for 10 days @ Rs.400/- per day (average of 10 teachers).	40,000
<b>Total</b>	<b>640,000</b>
<b>b. Recurring Expenditure</b>	
1. Computer Stationery (Printer cartridges, CD-ROMs, floppies, paper, etc.)	80,000
2. Electricity charges @ Rs. 1,000/- p.m.	12,000
3. Expenses on Diesel /Kerosene for generator @ Rs1,000/- p.m.	12,000
4. Telephone charges @ Rs. 500/- p.m.	6,000
5. Internet / Broadband charges	10,000
6. Teachers' salary @ Rs. 10000/- p.m.	120,000

*Source:* Revised Scheme of Information and Communication Technology in Schools (ICT in Schools) during the XI Plan', MHRD Amended Guidelines of ICT in Schools Scheme on 21.02.2011<sup>25</sup>.

7. Refresher training for 5 days to teachers @ Rs. 400/-per day (average of 10 teachers).	20,000
8. Management, Monitoring and Evaluation	10,000
<b>Total</b>	<b>270,000</b>

Support from the Central Government (non-recurring) also includes Annual Maintenance Contract for a minimum period of five years. The state can incur expenditure up to Rs.6.40 lakh on non-recurring items and Rs.2.70 lakh on recurring items subject to a maximum sum of Rs. 9.10 lakh per school. The Central share towards non-recurring and recurring expenditures for general category states (as per the 75:25 ratio) stands at Rs. 4.80 lakh and Rs. 1.83 lakh respectively subject to a maximum of Rs. 6.63 lakh per school; the balance is to be borne by the State Government.

The financial support is assured to CIET towards content development. The XI plan outlay (2007-2012) stands at Rs.43.30 crore. In case of SIETs the support is designed in the project mode where assistance would be provided on the assessment of the proposal by PMEG. Finally, the financial assistance to the institutes for content development through outsourcing contracts is subject to assessment by the Committee under the chairpersonship of Joint Director, CIET.

## **2.7 Few Observations on the Central Scheme**

The agenda of the Central Government to ensure the use of technology as a learning tool is evident from its varied ICT based endeavors since mid 2000. SAKSHAT education portal is a classic example of Central initiative towards ICT enabled stream following ICT @ Schools Scheme in 2004.



The National Mission on Education through ICT (NME-ICT)



*“A One Stop Education Portal ...to facilitate lifelong learning for students, teachers and those in employment or in pursuit of knowledge free of cost to them” (MHRD)<sup>26</sup>.*

*“Information and Communication Technologies have matured adequately to be used as a meaningful support to the education process. It can indeed go much beyond a Computer Literacy Programme” (MHRD, 2010:3). With this larger intent, the ICT Scheme was launched covering Secondary and Higher Secondary Government/Aided Schools across states in India.*

The salient features of the ICT scheme (laid down in the National Policy on ICT in School Education) have attracted schools to adopt ICT enabled education to improve the quality of education. are outlined below:

- Universal and free access to ICT tools and digital repositories in school by all students and teachers
- Development of ICT curriculum based on the local needs with the active participation of teachers and students in the creation and application of e-module.

---

<sup>26</sup> SAKSHAT is one of the Central models of virtual learning that shows how an ICT-enabled curriculum would be of immense use to the learners that has four e forums namely Student’s Corner, Teacher’s Corner, Knowledge Plus and Interact.

School Education Department, Government of Tamil Nadu has Sakshat link.

*Launched on October 30, 2006, “The content development task for ‘SAKSHAT’ was looked after by the Content Advisory Committee (CAC) for the respective subject, which consisted of representatives from educational institutions like IGNOU, Delhi University, Kendriya Vidyalaya Sangthan (KVS), Navodaya Vidyalaya Sangthan (NVS), National Institute of Open Schooling (NIOS) and National Council for Educational Research and Training (NCERT) and prominent academicians in the field. In addition, some NGOs had also provided the contents developed by them free of cost for this portal” (SAKSHAT: A One Stop Education Portal, Distance Learning, Department of Higher Education, Ministry of Human Resource Development, <http://mhrd.gov.in/sakshat>. Last accessed 24.09.2013.*

- Efficient functioning of ICT schools through collaborative efforts of resource persons, school academic and administration teams and networks for academic guidance and resource management.
- Promotion of ICT practices in research and evaluation and for innovative endeavours in schools.
- A critical understanding of the merits and demerits of ICT enabled education.

### 2.7.1 ICT scheme across States in India: Some Highlights

The progress of the scheme is viewed from two angles: a. Physical Expansion; b. Financial Disbursement.

#### Physical Coverage of ICT scheme

Table 2.2 Phased Expansion of ICT in Schools Scheme across States in India (2005-2013)

Details of State wise schools approved under ICT @ School Scheme

Name of State / UT	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	Smart schools
A & N Island	0	12	0	0	0	28	0	0	0
Andhra Pradesh	0	200	5000	2000	0	4031	0	0	5
Arunachal Pradesh	115	0	35	0	55	24	0	0	0
Assam	0	0	641	0	0	1240	969	0	0
Bihar	180	0	1000	0	0	0	0	0	0
Chandigarh	0	20	67	0	0	0	0	0	0
Chattisgarh	0	100	200	800	1100	0	0	0	0
D & N Haveli	0	6	6	0	0	11	1	0	0
Daman and Diu	0	0	22	0	0	6	0	0	2
Delhi	0	0	0	0	0	0	1110	0	2
Goa	0	0	432	0	0	0	0	0	0
Gujarat	0	0	0	3650	2730	0	0	0	0
Haryana	100	0	500	0	1000	1617	0	0	0
Himachal Pradesh	0	0	0	628	0	618	848	0	0
Jammu & Kashmir	0	0	0	0	200	0	0	0	5
Jharkhand	0	0	1074	0	0	0	0	0	0

Karnataka	480	0	2279	4396	0	0	0	0	0
Kerala	125	0	1016	3055	0	0	0	0	5
Lakshdweep	0	12	0	0	0	0	0	0	0
Madhya Pradesh	230	0	320	0	0	0	2000	0	0
Maharashtra	0	0	500	2500	0	0	5000	0	0
Manipur	0	0	65	0	0	260	0	0	4
Meghalaya	0	0	0	75	100	241	164	0	4
Mizoram	60	0	0	100	0	37	181	0	4
Nagaland	53	147	284	0	0	82	0	121	4
Orissa	0	0	0	0	0	4000	0	2000	0
Puducherry	0	25	169	0	0	0	182	0	4
Punjab	200	0	0	2000	870	494	0	134	5
Rajasthan	100	0	2500	2000	0	2000	0	0	0
Sikkim	103	0	2	0	0	42	0	0	4
Tamil nadu	125	0	400	400	1880	461	1999	0	5
Tripura	0	0	400	0	0	282	0	0	0
Uttarpradesh	0	0	2500	0	0	1500	1608	0	5
Uttarkhand	25	0	100	0	0	500	0	0	0
West Bengal	0	0	543	1400	0	2000	0	0	5
Total (89266)	1896	522	20055	23004	7935	19474	14062	2255	63

Source: [http://mhrd.gov.in/ict\\_physical](http://mhrd.gov.in/ict_physical): Physical and Financial Targets (Last updated 21 March 2013 - 2:42pm)<sup>27</sup>.

## Financial Disbursement to the State towards Scheme Implementation:

<sup>27</sup> Last accessed on 20.9.2013.

Table 2.3: Financial allocation for the ICT schools in India

DETAILS OF STATE-WISE FUND RELEASES UNDER ICT IN SCHOOL SCHEME DURING 2006-07, 2007-08, 2008-09, 2009-10, 2010-11 and 2011-12

Sl. No.	Name of State / UT	Fund Released					2011-12 (up to Feb. 2012)
		2006 - 07	2007 - 08	2008 - 09	2009 - 10	2010 - 11	
1.	A & N Island	--	--	18.00	17.25	67.20	67.20
2.	Andhra Pradesh	200.28	3750.00	5250.00	--	6600.00	4051.00
3.	Arunachal Pradesh	267.26	--	67.38	105.52	645.59	584.37
4.	Assam	--	1301.23	--	--	641.00	2182.40
5.	Bihar	--	--	895.93	--	--	--
6.	Chandigarh	35.20	100.00	--	182.75	--	--
7.	Chhattisgarh	247.70	--	2417.35	--	--	--
8.	D & N Havell	--	--	--	--	31.20	31.20
9.	Daman and Diu	--	--	41.00	--	14.40	18.75
10.	Delhi	--	--	--	--	399.00	--
11.	Goa	--	571.50	432.00	432.00	432.00	--
12.	Gujarat	--	1022.15	--	1871.78	6915.57	5107.649
13.	Haryana	250.00	1250.00	1250.00	1500.00	--	--
14.	Himachal Pradesh	--	--	772.44	--	753.60	1391.60
15.	Jammu & Kashmir	--	570.06	--	--	--	--
16.	Jharkhand	--	1074.00	--	--	--	--
17.	Karnataka	1200.00	4558.00	3150.00	--	--	56.42
18.	Kerala	312.50	1016.00	4071.00	4071.00	2600.00	5562.00
19.	Lakshdweep	08.40	--	--	--	--	--
20.	Madhya Pradesh	--	807.50	--	--	--	--
21.	Maharashtra	337.50	500.00	--	2250.00	--	--
22.	Manipur	--	195.97	195.98	391.95	65.65	--
23.	Meghalaya	--	--	428.88	--	386.59	20.00
24.	Mizoram	--	--	--	301.50	408.06	--
25.	Nagaland	327.37	1299.46	815.00	111.21	486.82	542.673
26.	Orissa	--	--	--	--	--	--
27.	Puducherry	34.47	259.53	--	--	--	--
28.	Punjab	--	91.24	3017.40	4305.00	4603.00	2890.00
29.	Rajasthan	--	400.00	1050.00	2300.00	4500.00	--
30.	Sikkim	--	--	--	--	418.97	--
31.	Tamil Nadu	--	1312.50	2681.00	318.72	0.00	2361.00
32.	Tripura	603.00	209.00	--	--	946.32	750.00
33.	Uttar Pradesh	--	3115.47	--	--	3984.8258	6268.174
34.	Uttarakhand	--	377.25	150.00	151.50	500.00	--
35.	West Bengal	--	964.33	762.42	--	3500.00	3520.00

Source: [http://mhrd.gov.in/ict\\_physical](http://mhrd.gov.in/ict_physical): Physical and Financial Targets (Last updated 21 March 2013 - 2:42pm)<sup>28</sup>

### Box 2.8: Central Scheme in Current News

'ICT in schools' scheme to be launched in 12,251 schools

<sup>28</sup> Web last accessed on 20.9.2013.

The centrally-sponsored “ICT in schools” scheme, that has helped check drop-out rate and spread computer education among children, will be launched in as many as 12,251 selected schools in six states in the ongoing financial year.

An amount of Rs 300 crore has already been allocated for the scheme for this fiscal, an official in the ministry of human resource and development said.

These schools are in the states of Karnataka, Kerala, Madhya Pradesh, Punjab, Tamil Nadu and West Bengal. While 4,396 schools have been selected in Karnataka, about 3,055 schools in Kerala and 2,000 schools in Punjab, 1,000, 400 and 1,400 schools have been selected in Madhya Pradesh, Tamil Nadu and West Bengal respectively, the official said - **The Financial Express Thursday, September 19, 2013**<sup>29</sup>.

### BOX 2.9: States complement to rejuvenate the Central model: Tamil Nadu Case

#### ICT-aided mode of instruction in govt schools to be expanded

With a view to encourage ICT-aided mode of instruction in state government schools, Tamil Nadu Chief Minister on Tuesday directed expanding an existing scheme to nearly 2000 more schools, allocating an initial sum of over Rs 26 crore towards it.

The expanded scheme would cover 1999 schools across the state and it would be implemented over five years at an estimated cost of Rs 127.94 crore, an official release here said.

CM allocated Rs 26.65 crore as first instalment for the scheme, it said, adding, 2341 schools had already been covered under the ICT-aided medium of instruction<sup>30</sup> - **Z News Friday, 20 September 2013**.

## 2.8 A brief note on the ICT @ school scheme in Tamil Nadu

### Emergence of ICT in Schools of Tamil Nadu

---

<sup>29</sup> <http://www.financialexpress.com>: last accessed 19.9.2013

<sup>30</sup> <http://zeenews.india.com/news/tamil-nadu>: last accessed 20.9.2013.



The Centrally sponsored ICT in Schools Scheme was launched in December 2004, and revised in 2010, to promote computer enabled learning and usage of ICT in teaching in Government and Government aided and Higher Secondary Schools with emphasis on educationally backward blocks and areas with concentration of SC/ST/Minority/weaker Sections. Under the Scheme there is a provision and provide financial assistance to States/Union Territories to procure computers and other ICT related infrastructure. The grant of Rs. 6.4 lakhs (non-recurring) and Rs. 2.7 lakhs (recurring) per School is given under the Scheme which is shared between Center and State in the ratio of 75:25 except for North East States where it is 90:10.

<b>Distribution of Funds to the State of Tamil Nadu for the implementation of ICT in Schools Scheme</b>		
<b>Year</b>	<b>No. of Schools Covered</b>	<b>Funds Released to Tamil Nadu</b>
<b>2010-11</b>	2341	Rs. 2341 lakh has been first released as first installment in 2011-12
	5 Smart Schools	Rs. 20.00 Lakh as first phase installment was released in 2011-12
<b>2011-12</b>	1999	Rs. 19.99 Crore released in 2011-12

The ICT in Schools Scheme as a component of the centrally sponsored Scheme of the eleventh plan wherein computers are provided to Schools on a sharing basis of 75:25 between the Government of India and State Government. 431 high Schools and 1910 higher secondary schools totally 2341 schools will be provided Information and Communication facility through “BOOT” Model over a period of five years commencing from the year 2011-12 at a total cost of Rs. 149.82 Crore and as first installment ofr the year 2011-12 an amount of Rs. 31.21 crore has been sanctioned by the Sate Government.

The Director of School Education Department, Tamil Nadu has issued corrigendum for implementation of ICT Scheme in 4340 government higher secondary schools at Chennai. The Tender has been announced on 05<sup>th</sup> September 2013.

### **Tender Notice for the implementation of ICT - BOOT Model**



**GOVERNMENT OF TAMIL NADU**  
**SCHOOL EDUCATION DEPARTMENT**  
**DIRECTORATE OF SCHOOL EDUCATION**  
**TAMILNADU STATE, CHENNAI - 600006**

**CORRIGENDUM - I to TENDER NOTICE**

**E-TENDER REF. No.NO.3 CSS/ICT/BOOT/2013-14**

**Dated 09.08.2013**

**Date: 05.09.2013**

The due date and time for submission of the e-Tender for Implementation of ICT Sheme in 4340 Govt. High / Higher Secondary Schools under BOOT Model throughout the State of Tamil Nadu is extended from **11.09.2013 at 01.00 P.M. to 04.10.2013 at 01.00 P.M.** The Technical Bid will be opened on **04.10.2013 at 02.00 P.M.** and the Commercial Bid will be opened on **25.10.2013 at 02.00 P.M.** All other terms and conditions in this regard would remain the same.

**Director of School Education**  
**Chennai - 600006**

**DIPR/4625/Tender/2013**

### **ICT initiatives taken by Tamil Nadu Government**

There are several initiatives taken by the State Government in related to Information and Communication Technology in Schools.

### **Education Management Information Center**

The School Education Department operates currently with the help of National Informatics Center for communication and website. The Government has announced creating an Education Management Information System (EMIS).

The web portal of the School Education Department of Tamil Nadu has been launched recently. It contains the complete data base of schools, teachers, students and department officials. The link is <http://www.tnschools.gov.in/>. The portal has all the information about various welfare schemes for teachers and students, events calendar, quality initiatives of the government, recent announcements, policy notes and statistical information etc.

### **SMS Based attendance**

The State Government has announced that in order to monitor the proper functioning of teachers a SMS based application will be developed for monitoring the attendance of the teachers. A special application has been developed for the same and integrated as a part of the EMIS. The attendance of teaching and non-teaching staff will be communicated by the Headmasters to the Central server which will in turn transmit the information to all the higher officials of the School Education Department. This is to bring discipline and to ensure availability of teachers in the Class rooms.

### **Smart Card**

All the Students in Government and Government aided Schools will be provided with the Smart Card which will consist of all the details pertaining to the child and the same will be stored in the central server. The card is again integrated with the EMIS.

### **Education Content Server**

The EMIS server would have e-versions of various contents and resources that would help the teaching, learning process for both curricular and co-curricular activities. The unique feature of this ECS would be that contents could be updated online on a regular basis.

### **Project Shiksha**

This is a programme being done in collaboration with Microsoft. A Memorandum of Understanding (MoU) was signed with Microsoft for providing comprehensive computer training to teachers in Government Schools. The MoU will be extended for the year 2012-13 to cover 25 teachers per batch per block in seven districts.

### **Intel® Teach Programme**

In association with Sarva Shiksha Abhiyan (SSA) in Tamil Nadu “Intel Teach Programme” was launched in the year 2004 to promote ICT integration in schools of Tamil Nadu. In-service Teachers Development Programme, Training Programme for DIETs and ICT in Education Implementation Support are some of the modules organized by Intel.<sup>31</sup>

### **Computer Education to Students in Standards VI to X**

In the Policy Note 2012-13 of School Education Department, it is stated that Computer Science courses both in Tamil and English medium has been introduced for standards VI to X. The books for this course will be distributed to students studying in Government High and Higher Secondary Schools.

### **Computer Aided Language Learning Laboratories**

In the Policy Note 2012-13 of School Education Department, it is stated that in 248 Government Higher Secondary Schools, the existing computer labs have been converted into Computer Aided Language Labs by providing Software and hardware materials at a cost of Rs. 25.00 Lakhs.

These are the initiatives taken by Government of Tamil Nadu regarding ICT in Schools parallel to the implementation of centrally sponsored ICT Scheme.

---

<sup>31</sup> For more details see: <http://ssa.tn.nic.in/Partners.htm>

## **CHAPTER 3**

### **ICT INFRASTRUCTURE IN THE SCHOOLS OF TAMIL NADU**

#### **3.1 Introduction**

This chapter has been compiled based on the information provided by the Department of School Education, Government of Tamil Nadu (DSE,TN) regarding the status of ICT implementation and the ICT infrastructure currently available in the schools of Tamil Nadu. As per the guidelines given by MHRD for the evaluation of ICT @ school scheme, the state and district authorities have submitted the complete data on the implementation of ICT in the schools of TN, including the inventory status of ICT tools distributed by the State. Comprehensive data given by the DSE, TN has been summarized in this chapter.

### 3.2 Implementation of the Scheme

The state of Tamil Nadu has implemented this scheme since 2006-2007 and coverage of the scheme is given in Table. 1

Table: 1 Implementation of the Scheme

<b>Year of Implementation</b>	<b>Number of Districts/Schools</b>	<b>Vendor</b>	<b>Status of Implementation</b>
<b>2004-05</b>	-	-	-
<b>2005-06</b>	-	-	-
<b>2006-07</b>	125 Government High Schools*	ELCOT Limited	Completed
<b>2007-08</b>	400 Government High Schools*	ELCOT Limited	Completed
<b>2008-09</b>	400 Government High Schools*	ELCOT Limited	Completed

Source: Data provided by Department of School Education, Government of Tamil Nadu

\*The district wise list of schools is attached to Annexure 1.

### 3.3 Status of ICT implementation at the District Level

Table: 2 Status of ICT implementation in the evaluated districts

<b>STATUS OF ICT IMPLEMENTATION IN THE EVALUATED DISTRICTS</b>			
<b>District</b>	<b>Total No of High &amp; Higher Sec Schools</b>	<b>No. of schools implemented ICT</b>	<b>% of Schools Implemented ICT</b>
<b>Chennai</b>	56	51	91%
<b>Dharmapuri</b>	213	132	62%
<b>Villupuram</b>	380	233	61%
<b>Coimbatore</b>	258	143	55%
<b>Tiruvannamalai</b>	379	204	54%
<b>Cuddalore</b>	274	142	52%
<b>Dindigul</b>	220	98	45%
<b>Virudhunagar</b>	269	58	22%

Source: Data provided by Department of School Education, Government of Tamil Nadu

The total number of schools in the above table includes Government high schools, Government Higher secondary schools, Government aided high schools and Government Aided higher secondary schools and other special schools. According to the data given by Department of School Education, Govt. of Tamil Nadu 91% schools has implemented ICT, Dharmapuri – 62%, Villupuram 61%. The remaining districts comes below 60%, Coimbatore – 55%, Tiruvannamalai – 54%, Cuddalore – 52%, Dindigul and Virudhunagar falls down to 45% and 22% respectively.

In Tamil Nadu, ICT is being implemented only in Government high schools and higher secondary schools. Except very few schools in Tirunelveli, Karur, Thiruvarur and Chennai districts, the scheme has been implemented only in Government schools and not in Government Aided schools. In Chennai, 27 Government Aided Higher Secondary schools have implemented ICT.

### **ICT Facilities – District Level Inventory Status**

Table: 3 ICT Facilities – District wise inventory status

<b>ICT FACILITIES - DISTRICT WISE INVENTORY STATUS</b>								
<b>District</b>	Total Laptops	Total Desktops	Digital Projectors	UPS	Printers	Scanners	RoTs	SITs
<b>Chennai</b>	45	408	49	51	46	2	0	0
<b>Dharmapuri</b>	105	1220	207	207	207	207	0	0
<b>Villupuram</b>	314	2275	142	290	284	46	0	0
<b>Coimbatore</b>	143	896	65	114	100	70	0	0
<b>Tiruvannamalai</b>	135	1600	204	204	204	5	0	0
<b>Cuddalore</b>	92	1195	139	142	142	24	0	0
<b>Dindigul</b>	98	749	80	107	80	9	0	0
<b>Virudhunagar</b>	46	535	56	63	58	20	0	0
<b>Total Distribution</b>	<b>978</b>	<b>8878</b>	<b>942</b>	<b>1178</b>	<b>1121</b>	<b>383</b>	<b>0</b>	<b>0</b>

Source: Data provided by Department of School Education, Government of Tamil Nadu

In Tamil Nadu, the laptops have been distributed to all the school HMs. The maximum of 314 laptops are given to Villupuram schools, while it between 100 to 150 laptops in Dharmapuri, Tiruvannamalai and Coimbatore. Other districts, Chennai, Cuddalore, Dindigul and Virudhunagar have less than 100 laptops.

The desktops are distributed to almost all the schools in Tamil Nadu through EICot. The maximum number is 2275 desktops in Villupuram district, in Chennai – 408, Dharmapuri – 1220, Coimbatore – 896, Tiruvannamalai – 1600, Cuddalore 1195, Dindigul 749 and in Virudhunagar being the least number 535 desktops.

Digital Projectors are available in some of the schools; maximum number of 207 digital projectors has been distributed in Dharmapuri district. Secondly, Tiruvannamalai district with 204 digital projectors. In Chennai-49, Villupuram – 142, Coimbatore – 65, Cuddalore – 139, Dindigul – 80 and Virudhunagar – 56 projectors are available as per the data. A total number of 942 digital projectors were given in the 8 evaluated districts.

The Uninterrupted Power Supply (UPS) has been distributed to 1178 schools in the 8 evaluated districts. Maximum numbers of UPS are distributed in the districts Dharmapuri, Villupuram and Tiruvannamalai 207, 290 and 204 respectively. In Coimbatore it is 114, Cuddalore – 142, Dindigul 107, Virudhunagar – 63 and in Chennai 51 schools have UPS.



Printers are available in almost all the schools; however in many schools there are only dot matrix printers distributed. Maximum numbers of UPS are distributed in the districts Dharmapuri, Villupuram and Tiruvannamalai 207, 284 and 204 respectively. In Cuddalore it is 142, Coimbatore – 100, Dindigul -80, Virudhunagar – 58 and in Chennai it is 46 printers.

Scanners were not distributed equally across all the schools. Only in Dharmapuri, there are 207 scanners given to schools. In Coimbatore and Villupuram it is 70 and 45 respectively. In the remaining districts, only is less than 30 schools scanners had been given by the Government. Virudhunagar – 20 scanners, Cuddalore – 24 scanners, Dindigul – 9, Tiruvannamalai – 5 and in Chennai there were scanners only 2 schools.

### RoTs and SITs

The Receive only Terminals and Satellite Interactive Terminals (SITs) were not found in any of the schools in evaluated 8 districts.

### 3.4 Information on Internet

Table: 4 Information on the Internet connectivity

Information on Internet					
District	Total No. of Schools	No. of Net connecte d schools	% Net connected	Details Dial/up/Broad band/Wireless/V -Sat	Details of bandwidth/BP S
Chennai	56	20	36%	Broadband	
Dharmapuri	213	207	97%	Broad/data card	
Villupuram	380	0	0%	-	-
Coimbatore	258	143	55%	Broadband	
Tiruvannamalai	375	90	24%	Broadband	
Cuddalore	274	113	41%	Broadband	
Dindigul	220	98	45%	Broadband	
Virudhunagar	269	29	11%	Broadband	

Source: Data provided by Department of School Education, Government of Tamil Nadu

In most of the schools, they are having a broadband connection and in some schools data card is used for administration purposes. In Dharmapuri, 97% schools are net connected and in Coimbatore 55% schools are having internet connection. In Chennai, Cuddalore and Dindigul, the average schools connected with internet ranges between 35% - 45%. In the remaining districts,

Tiruvannamalai and Virudhunagar it is less than 25%. Villupuram has given the data as 0% with respect to internet connection.

### 3.5 Use of Email facility

Table: 5 Use of email facility

District	Total No. of Schools	No. of schools use the email facility	% schools
Chennai	56	20	36%
Dharmapuri	213	207	97%
Villupuram	380	0	0%
Coimbatore	258	143	55%
Tiruvannamalai	375	90	24%
Cuddalore	274	113	41%
Dindigul	220	98	45%
Virudhunagar	269	29	11%

Source: Data provided by Department of School Education, Government of Tamil Nadu

Except Villupuram district, all other district use email facility for some purposes. Dharmapuri uses email facility at the maximum of 97% and Coimbatore 55%. The remaining districts use email facility in less than 50% schools.

### 3.6 Website Information

Table: 6 Website Information

District	Total No. of Schools	No. of schools having website information	% schools
Chennai	56	3	5%
Dharmapuri	213	0	0%
Villupuram	380	0	0%
Coimbatore	258	0	0%
Tiruvannamalai	375	0	0%
Cuddalore	274	0	0%
Dindigul	220	0	0%
Virudhunagar	269	0	0%

Source: Data provided by Department of School Education, Government of Tamil Nadu

There is no website created for schools in any of the districts except Chennai. In Chennai, 3 schools are having a separate website URL for the school. All the information about the school, regarding children, other activities of the school is updated in the website and the HMs feel that it is a good promotion for the school. The HMs added that it helps them in increasing the school enrollment. In other districts also, the HMs requested to make a provision to launch a school website.

### 3.7 Operating Software

Table: 7 Operating Software

District	Total No. of Schools	Availability of Operating software	% schools
Chennai	56	0	0%
Dharmapuri	213	213	100%
Villupuram	380	0	0%
Coimbatore	258	258	100%
Tiruvannamalai	375	204	54%
Cuddalore	274	142	52%
Dindigul	220	135	61%
Virudhunagar	269	143	53%

Source: Data provided by Department of School Education, Government of Tamil Nadu

Almost all the school that are having internet connection and email facility is having an operating software in their computers. Most of the schools have only Microsoft and in rare cases Linux and other software is updated.

### 3.8 Edusat Training Centres

The Edusat Training Centres are functioning only in Tiruvannamalai district. There are several trainings conducted through Edusat in Tiruvannamalai. The various training topics include SLM Maths Kit, Social Science for VIth standard, CAL, English Grammer activity, SLM primary students usage of Maths kit, Simple English, OoSc review, Literary skills (Story telling), Spoken English and Conversation skill for Upper primary level, CRC training, Science for Upper primary students, Learners' assessment, Radio English for primary students, Maths for upper primary students and IED review.

### **3.9 District Resource Centres**

In none of the evaluated districts a District Resource Center (DRC) was found.

### **3.10 IT applications for administrative functions**

The IT application for administrative functions is used in almost all the districts but to a limited extent only. The IT application is used basically for the computation of Teachers' salary, Students marks, a data base of students and teachers, rarely few schools use email communication amongst teachers. Other than these categories IT is not used for any other purpose.

### **3.11 MIS report generation**

Only in Dharmapuri out of the 8 evaluated districts had given the data on the MIS report generation. This district has both Education Management Information System (EMIS) accessed by teachers and students and PIS (Personal Information System) accessed only by teaching and non-teaching staff.

### **3.12 Training on ICT for Administrative staff**

None of the schools in the 8 evaluated districts there was training provided to Administrative staff on ICT.

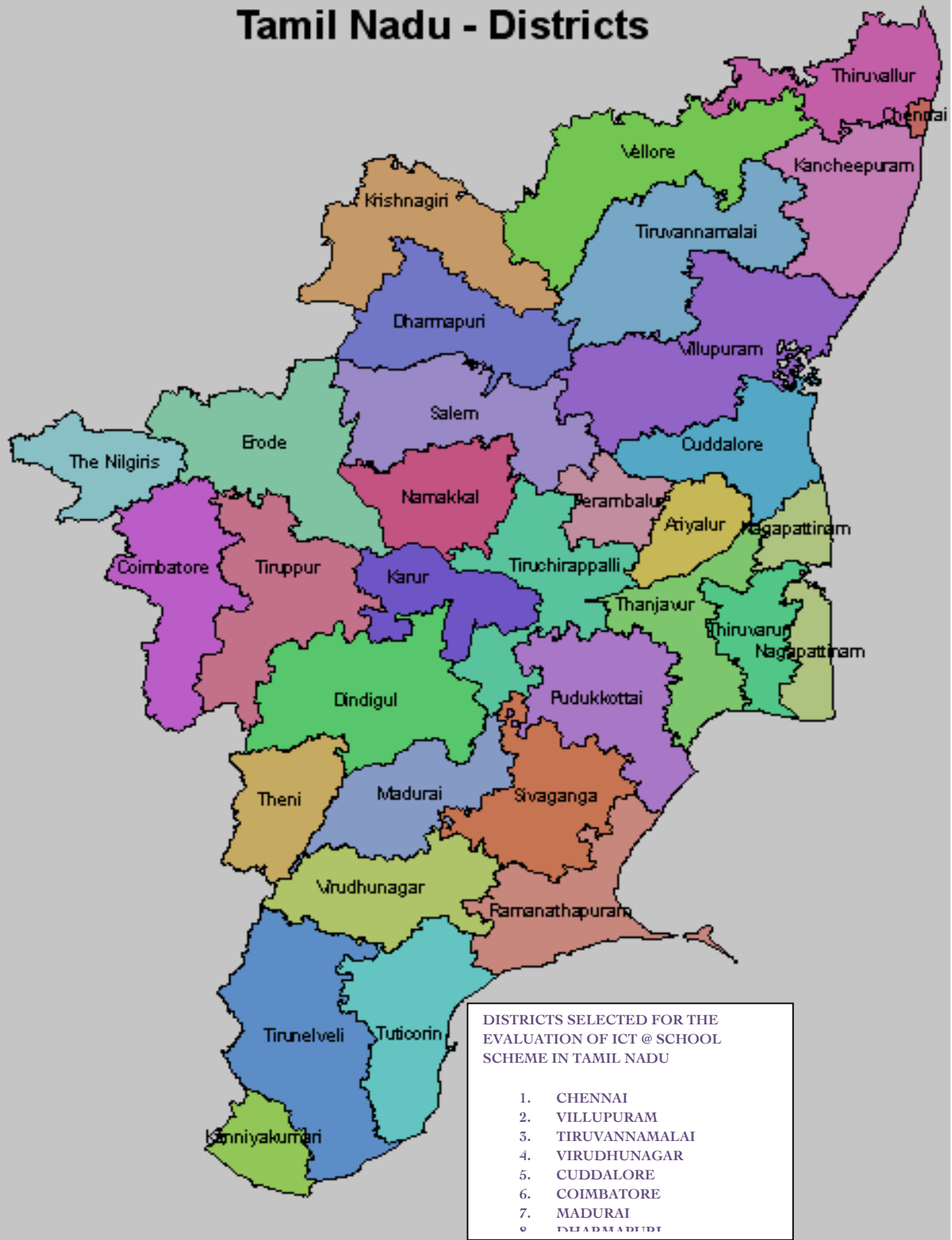
### **3.13 Capacity Building**

There is no capacity building trainings or programmes conducted in any of the 8 evaluated districts.

## **CHAPTER 4**

**QUANTITATIVE ANALYSIS AND IMPACT ASSESSMENT OF ICT IMPLEMENTATION IN THE  
SCHOOLS OF TAMIL NADU**

# Tamil Nadu - Districts



#### 4.1 Quantitative Assessment of ICT Implementation In Schools

The assessment tools for ICT evaluation were provided by MHRD. The tools have been designed separately to gather primary and secondary information at the State, District and at the Local level. Also, different sets of questionnaires were made available to interview the HMs of the Schools, ICT Teachers, Non-ICT Teachers and Students.

The Evaluating Institute covered the districts Chennai, Tiruvannamalai, Villupuram and Cuddalore in Phase-1 and Coimbatore, Dindigul, Virudhunagar and Dharmapuri during Phase-2 of the Evaluation. Altogether, the team has surveyed 80 schools (10 schools in each district) on ICT implementation

The outcomes of the assessment have been given under four heads, **Infrastructure, Curriculum, Staff and Students.**

**Table: 1 General Enrollment Pattern:**

District Name	Total General Enrollment	Total SC Enrollment	Total ST Enrollment	Total Enrollment	% Genl	%SC	%ST
Chennai	3793	3615	6	7414	51%	49%	<1%
Cuddalore	6473	4964	52	11489	56%	43%	<1%
Thiruvannamalai	5796	2070	150	8016	72%	26%	2%
Villupuram	4267	3041	1551	8859	48%	34%	18%
Coimbatore	6478	2637	349	9464	68%	28%	4%
Dharmapuri	6944	1339	815	9098	76%	15%	9%
Dindigul	4472	2094	61	6627	67%	32%	1%
Virudhunagar	3375	1529	2	4906	69%	31%	<1%
<b>Grand Total/Average</b>	<b>41598</b>	<b>21289</b>	<b>2986</b>	<b>65873</b>	<b>63%</b>	<b>32%</b>	<b>5%</b>

The table gives the district wise general enrollment pattern of the schools selected for ICT evaluation. THE DATA GIVEN IS ONLY WITH RESPECT TO THE EVALUATED SCHOOLS IN TAMIL NADU.

The Enrollment pattern shows on an average 63% in General category, 32% in SC category and 5% ST category. In Chennai there is 51% enrollment in General and 49% in SC category. In other districts the ratio varies between 70:30 and 60:40 in the enrollment of General and SC category students. ST enrollment constantly remains below 10% in all the districts except in Villupuram where it is 18%.

#### 4.2 Infrastructure in Schools

The assessment of general infrastructure available in the schools gives us an idea of how favorable or unfavorable the conditions are for the implementation of ICT.

Table - 1 illustrates the infrastructural scenario of the schools evaluated for ICT implementation in 8 districts in the state of Tamil Nadu. The sample of 80 schools is equally distributed as 10 schools in each district.

**Table: 2 Infrastructure of the schools evaluated for ICT implementation**

Name of the District	Chennai	Villupuram	Tiruvannamalai	Cuddalore	Coimbatore	Dharmapuri	Virudhunagar	Dindigul
Class room	100%	100%	100%	100%	100%	100%	100%	100%
Drinking Water	100%	100%	100%	100%	100%	100%	100%	90%
Toilets	100%	100%	100%	100%	100%	100%	100%	90%
Play Ground	99.00%	100%	100%	100%	100%	90%	100%	80%
Electricity	99.00%	100%	100%	100%	100%	80%	100%	100%
Solar Power	0.00%	0%	0%	0%	0%	0%	0%	0%
Generator	0.00%	0%	0%	0%	0%	0%	0%	0%
Inverter	10.00%	0%	0%	10%	10%	10%	10%	0%
Natural Gas	0.00%	0%	0%	0%	0%	0%	0%	0%
LandLine	98.00%	100%	100%	100%	100%	100%	100%	100%
Mobile Phone	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Fax Machine	30.00%	0%	0%	0%	0%	0%	0%	0%
Cable TV	0.00%	0%	0%	0%	0%	0%	0%	0%
Satellite	0.00%	0%	0%	0%	0%	0%	0%	0%
RoT	0.00%	0%	0%	0%	0%	0%	0%	0%



**Class room:** All the 80 schools surveyed for ICT have enough number of class rooms in proportion to the students in each class, except a School in Dharmapuri District, Government Higher Secondary School Thoppur village, where there were only 20 class rooms to accommodate the total strength of 1294 students in the school. The class rooms were very small and the seating arrangement was congested.

**Drinking Water & Toilet Facility:** All the schools have drinking water facility and Toilet facilities except the Government Adi-Dravida Welfare Higher Secondary School, Muruganpatti, Dindigul district.

**Playground:** All the schools have a playground though some of the grounds are very small. In Chennai, Model Government Higher Secondary School and Dr. Ambedkar Government Higher Secondary School do not have a playground. The former school had one but it has been acquired by the Railways department for Metro Rail Project. In Dharmapuri and Dindigul Districts, 90% and 80% of the schools have playground respectively.

**Reliable Electricity:** Reliable electricity is one of the basic requirements for the implementation of ICT in schools. Almost in all the schools there was reliable electricity available except one school in Chennai [Government Girls' Higher Secondary School, Triplicane] and two schools in Dharmapuri district [Government Higher Secondary School Thoppur and Naripalli] which have complaints about unreliable electricity supply.

**Solar and Generator Power:** None of the schools in the 8 districts had either Solar or Generator Power plants.

**Inverter:** Only 6% of the schools have an inverter. The Government Higher Secondary Schools in Elagiri-Dharmapuri, Negamam Coimbatore, Alangulam Virudhunagar, Panrutti and Thiruvandhipuram in Cuddalore district have inverters. In Thiruvandhipuram, the Agarwal Sweet shop owner has sponsored an inverter for the school and in Panrutti, inverter is used only in office room.

**Natural/Gobar Gas:** Natural Gas is also not available in any of the schools evaluated for ICT.

**Land Line and Mobile Phone:** Land Line phone is available in all the schools except Government Model Higher Secondary School, Saidapet in Chennai district. The cable has been damaged due to the Metro Rail Project in this area. Mobile phone is not available in any of the Schools.

**Fax machine:** Fax machine is available only in 4% schools that too in Chennai district only. The Government Higher Secondary School, West Mambalam and Corporation Higher Secondary Schools Choolaimedu and Nesapakkam are the only schools having a Fax Machine.

**Cable TV/Satellite and RoT:** None of the schools have Cable TV connection or Satellite or Receive only Terminals.

#### 4.3 Availability of ICT Department, Computer Labs and External Support in Schools

**Table: 3 Availability of ICT Department, Computer Labs and External Support in schools**

Availability of department, computer labs and external support		
Row Labels	ICT DEPARTMENT	COMPUTER LAB
Chennai	0%	100%
Cuddalore	0%	100%
Thiruvannamalai	0%	90%
Villupuram	0%	100%
Coimbatore	0%	70%
Dharmapuri	0%	90%
Virudhunagar	0%	100%
Dindigul	0%	90%

In Tamil Nadu, there is no separate department called ICT department in schools. The computer Lab is considered as ICT department.

Computer Labs are available in 100% of the schools in Chennai, Cuddalore, Villupuram and Virudhunagar districts, 90% of the schools in Thiruvannamalai, Dharmapuri and Dindigul districts and 70% Schools in Coimbatore district. In almost all the Schools, the computer labs are used only by the 11<sup>th</sup> and 12<sup>th</sup> standard students who have taken Computer Science as elective subject. In Virudhunagar district, though the labs are available in 100% Schools, only 50% schools use the computer lab and the remaining Schools have kept the computer rooms locked. Also, in Dharmapuri, Villupuram and Dindigul the computer labs are used only occasionally.

## External Support for ICT

The External support for ICT implementation is very minimal. Only in Chennai District, 20% of the schools have got external support related to ICT. There was a Subject oriented computer training provided by Indian Institute of Technology Madras (IITM) for a week to HMs and Computer teachers of West Mambalam Government Higher Secondary School. NIIT and Microsoft have organized a 10-day training camp separately for the teachers and HM on Basic computer operations, MS Office (Word, Excel, PPT), Internet surfing and Emailing in Model Government Higher Secondary School, Saidapet. The remaining districts do not have any external support for ICT.

**Table: 4 Year-wise Categorization of ICT intervention in the Schools**

Year-wise categorization of ICT intervention in the Schools									
Year of ICT Intervention	Chennai	Cuddalore	Thiruvannamalai	Villupuram	Dindigul	Coimbatore	Virudhunagar	Dharmapuri	Grand Total
1986		1							1
1997	1								1
1998		1							1
1999	5			1		2			8
2001	1	1	1				1	1	5
2002				1					1
2005	1				9	2	5	3	20
2007	2	5	7	6	1	6	4	4	35
2008		2							2
2009			2	2				2	6
<b>Grand Total</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>80</b>

In many districts, ICT intervention was during the period 2005-2007. In Cuddalore and Chennai districts, the ICT intervention started early in the years 1986 and 1997 respectively. In 35 Schools, across districts, ICT has been introduced in the year 2007. Dindigul is the only district in which there was no intervention until 2005.

#### 4.4 ICT facilities available in schools

**Table: 5 - Availability and Working Condition of ICT Facilities in Schools**

<b>AVAILABILITY AND WORKING CONDITION OF ICT FACILITIES IN SCHOOLS</b>					
<b>Availability</b>	Available	Not Available	Available %	Not Available %	Working condition of available ICT Facilities
<b>Individual PCs</b>	80	0	100%	0%	78%
<b>Laptops</b>	76	4	93%	7%	34%
<b>Server with Terminals</b>	80	0	100%	0%	95%
<b>Projector</b>	77	3	98%	2%	59%
<b>Printer</b>	80	0	100%	0%	86%
<b>Scanner</b>	5	75	3%	97%	100%
<b>Web camera</b>	4	76	5%	95%	100%
<b>Modem</b>	27	53	34%	66%	100%
<b>Broadband Antenna</b>	0	80	100%	0%	100%
<b>Generator/Solar</b>	0	80	0%	100%	NA
<b>UPS</b>	80	0	100%	0%	75%
<b>Video Camera</b>	3	77	7%	93%	100%

#### **Individual PCs**

It has been noted that all the 80 schools are provided with computers from minimum 10 to maximum number of 30 per school including the PC's given to HMs and for office purposes. However, only 78% of the computers are in working condition and the remaining 22% of the systems are under repair, some for several years.



### **Lap tops**

One lap top has been given to the HMs in 74 Schools (93%) out of which only in 56 Schools (75%) the laptops are in working condition. However, in 30 Schools the HMs were not trained to use lap tops. Hence, in most of the cases the lap tops given to HMs are not used.

### **Server with Terminals**

Server with Terminals is available in all the 80 schools, but in 4 schools it is not in working condition.

### **Projector**

Projector is available in 77 Schools (97%) but only in 46 Schools (59%) it is in working condition. However, the remaining 31 schools are also not utilizing the projectors completely. The Projectors were found unused in most of the Schools. The HMs responded that the projectors remain unused because of non-availability of multi-media tools. Subject oriented CDs or DVDs are not available. The Teachers stated that the availability of such material alone could not resolve the issue because the teaching schedule is totally full.



### **Printer**

Printers are available in all 80 schools but only in 69 schools printer is in working condition. In most of the schools, the available printers are old model dot matrix printers. There is a request from the HMs to provide new model laser printers.



### **Scanner**

Scanners are available only in 3 Schools, 1 School in Chennai district and 2 Schools in Dindigul District. Scanner is not available in any other School.

### **Web camera**

Web cameras are available only in 3 schools, 2 schools in Chennai District and 1 school in Dindigul District. Note: web cameras have been provided only to Corporation Schools.

### **Modem**



Modem is available in 28 schools (35%) and the remaining 52 schools (65%) do not have Modem.

### **Broad band Antenna/Generator/Solar/Video Camera**

Broad band Antenna, Generator, Solar and Video Camera are not available in any of the 80 schools in 8 districts.



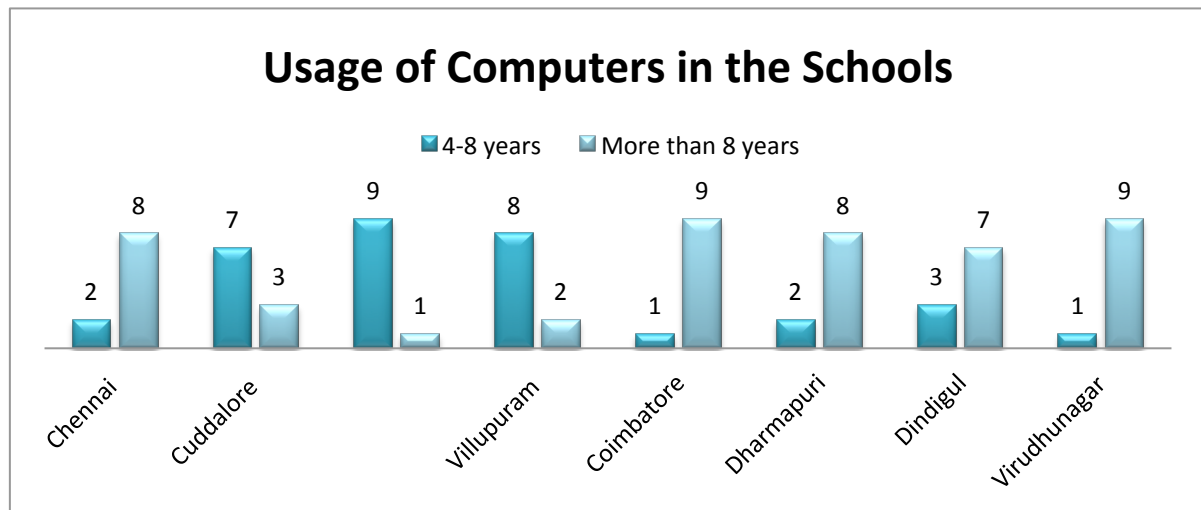
### **4.5 Computer Networking Environment in Schools**

**Table: 6 – Computer Networking Environment in Schools**

COMPUTER NETWORKING ENVIRONMENT IN SCHOOLS				
District	Total No. of computers in schools	No. of computers networked	Number of computers not networked	% of Networked computers
Chennai	174	13	161	7%
Cuddalore	100	9	91	9%
Thiruvannamalai	116	7	109	6%
Villupuram	103	9	94	9%
Coimbatore	78	11	67	14%
Dharmapuri	97	21	76	22%
Dindigul	89	21	68	24%
Virudhunagar	74	10	64	14%
Grand Total	493	38	455	

In most of the schools, the computer networking environment is poor. Computers are networked in less than 10% Schools in Chennai, Cuddalore, Tiruvannamalai and Villupuram. 15-25% computers are networked in the districts Virudhunagar, Dindigul, Dharmapuri and Coimbatore. Internet connection is usually functional only in the systems that are kept in the office room.

**Graph: 1 Usage of Computers in the Schools**



The usage of computers in 47 schools (59%) is for more than 8 years and in the remaining 33 schools (41%) it ranges between 4-8 years. Majority of the Schools in Chennai, Coimbatore,



Dharmapuri and Virudhunagar districts have been using computers for more than 8 years, while in Cuddalore, Tiruvannamalai, Villupuram and Dindigul computers have been in use for between 4 and 8 years.

**Table: 7 Prioritization of Infrastructural needs in schools**

Ranking	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total	
Audio/language lab		16						2	10	20		16				16	80	
common service centre in the neighborhood	58	2									20						80	
Community /Campus Radio station										10	16	22		16	16		80	
Computers		6	16					1		16	11		20	10			80	
dish TV connections			8			1		2	16				26	20		7	80	
Educational CDs/DVDs				2				18	20			26		14			80	
Internet facilities	20	10		16			10	1	0				23				80	
Multimedia tool	2	16	10		16			20				16					80	
Multimedia Presentations				10		10	36				9			10		5	80	
Presentations made on Flash software				16		19		16		8	10		11				80	
Radio			16		10			2	6	10						36	80	
School Blog				10	12			6			14					18	20	80
School Website		20				28	6			16				10			80	
Subject specific software in computers																		
Television				6	36			12	16							10	80	
Thumb drives/pen drives /USB drives		10	20		6	16	28										80	
Video conferencing/ V-Sat/Teleconferencing			10	20		6			12								32	80

The HMs of the schools had been requested to give a priority list on their perception of the basic ICT tools and infrastructure needed in their respective schools. The table above shows the prioritization of requirement in their respective schools.

- **Common service Center in the neighborhood:** 58 schools (73%) opted for a Common service center in the neighborhood as one of the most important requirement. The school HMs also pointed out that there is no provision for them to allocate funds for repairs and maintenance of computers and other electronic devices, and that computers, projectors, printers and other ICT tools distributed by ELCOT have no replacement warranty. The concern of the HMs was the

minor repair when unattended for a longer period makes the device dysfunctional. 68 out of 80 HMs stated that there is a need to allocate funds in the annual budget for minor repairs of ICT.

- **Educational CDs/DVDs:** 52 schools feel they need access to You tube videos, documentaries, etc. The HMs stated that the projectors remain unused due to unavailability of subject oriented CDs and DVDs.
- **Internet facilities:** Internet facility is one of the major concerns in almost all the schools. Internet connection is provided only to one or two computers that are installed either in the office room or HM room. None of the computers in the computer lab have an internet connection. The teachers also expressed their need for an internet connection at least for minimum usage.
- **School Website:** None of the schools have a separate website. 68 schools prioritized school website in first place. The HMs felt that it would be useful for them to update the achievements of the school and also to increase the student enrollment.
- **Subject specific Software:** 36 schools prioritized subject specific software in the fifth place. ICT when taught as a subject at the higher secondary level requires such subject specific software. The students are taught ICT only as theory and the computer teachers stated that they couldn't take practical classes without the software.
- **Thumb drives/Pen drives / USB drives:** 10 Schools opted for thumb drives / pen drives / USB drives in the second place because they wanted to store or transfer data using the drives. 20 schools opted this as 3rd priority.

#### **4.6 Curriculum for ICT**

From the field survey, we found that there is no separate curriculum available to teach computer science as a subject for the classes IX and X. As of now, Computer Science is taught as a subject only to XIth and XIIth Standard students provided they have computer science as their elective subject.

In reference to the Policy Note 2012-13 Demand NO. 43, School Education Department, Government of Tamil Nadu has announced that a separate Computer Science course will be initiated in Government High and Higher Secondary Schools from Standard I to X.

#### **Table: 8 ICT- Academic Level Offering**

<b>ICT - Academic Level Offering in Schools</b>			
<b>Row Labels</b>	<b>Primary &amp; Middle School (I to VIII)</b>	<b>High School (IX &amp; X)</b>	<b>Higher Secondary (XI &amp; XII)</b>
<b>Chennai</b>	3	3	10
<b>Cuddalore</b>	0	1	10
<b>Thiruvannamalai</b>	0	0	10
<b>Villupuram</b>	0	0	10
<b>Coimbatore</b>	0	2	10
<b>Dindigul</b>	0	4	10
<b>Dharmapuri</b>	0	0	10
<b>Virudhunagar</b>	0	8	10
<b>Grand Total</b>	<b>3</b>	<b>18</b>	<b>80</b>
<b>Percentage</b>	<b>4%</b>	<b>23%</b>	<b>100%</b>

The Academic level offering in Schools was found to be very limited across the districts. Only 4% Schools are offering ICT at the Primary and Middle level. The Model Government Higher Secondary School, Saidapet and Corporation Schools in Nesapakkam and Choolaimedu offer ICT as part of academics at the Primary level. 23% Schools across 8 districts offer ICT classes for 9<sup>th</sup> and 10<sup>th</sup> standard. This is usually a school level initiative taken by active HMs. They do not have any curriculum or text book to teach computer science. Also, there is no separate teacher appointed to conduct the classes for high school students. The higher secondary teacher takes the responsibility for these introductory classes. In Tiruvannamalai, Villupuram and Dharmapuri districts, none of the Schools provide an academic level offering either at Primary or High School level.

ICT is taught as a subject only at the Higher Secondary Level in 100% schools but only for those students who have opted for computer science as their elective subject. The usage of computer lab is restricted only to these students and not for everyone in the School.

### **ICT - Teaching Hours**

ICT is taught as a subject only to the Students who have opted for computer Science as their elective subject. The subject is added to their every day time-table and structured as 8 periods in a week which also includes practical sessions. Each period will last for 45 minutes and totally it is allocated as 360 minutes a week. Out of the 8 periods in a week, 2 periods are dedicated to practical classes.

### **STAFF**

The sample size taken for ICT teacher is one ICT teacher from each school i.e. 80 ICT teachers. Non-ICT teachers sample has been taken as 4 Teachers from each School [One Teacher in each subject like Science, Social Studies, Language, and Mathematics] making the sample size 320.

### ICT training for teaching and non-teaching staff

The Non-ICT teachers have been given a minimum computer training on the basics, MS office and internet usage. Most of the trainings were organized by State SSA authorities and hence had been given only to the Secondary Grade (SG) teachers. However, there were no practical sessions conducted during the training. Also, after the training, teachers had no opportunity to use computers due to their rigid academic schedule in teaching the regular subjects.

**Table: 9 – Non-ICT Teaching Staff Trained in ICT**

TEACHING STAFF TRAINED IN ICT - GENDER WISE STATUS				
District Name	Male	Female	Male Trained in ICT	Female Trained in ICT
Chennai	89	266	39%	55%
Cuddalore	136	219	41%	45%
Thiruvannamalai	120	110	42%	33%
Villupuram	168	109	46%	30%
Coimbatore	114	229	13%	19%
Dharmapuri	195	104	13%	21%
Virudhunagar	88	132	24%	23%
Dindigul	106	162	18%	12%
<b>Total</b>	<b>1016</b>	<b>1331</b>	<b>-</b>	<b>-</b>

*Note: All the trained staff are Secondary Grade teachers. No formal training has been provided to PG teachers*

From the table, there is no gender specific differentiation found in providing training on computers. In Chennai, 39% male and 55% female, Cuddalore 41% male and 45% female, Tiruvannamalai 42% male and 33% female, Villupuram 46% male and 30% female, Coimbatore 13% male and 19% female, Dharmapuri 13% male and 21% female, Virudhunagar 24% male and 23% female, Dindigul 18% male and 12% female had been trained on computer. However, none of the PG teachers have been given basic computer training.

### Non-Teaching Staff trained in ICT

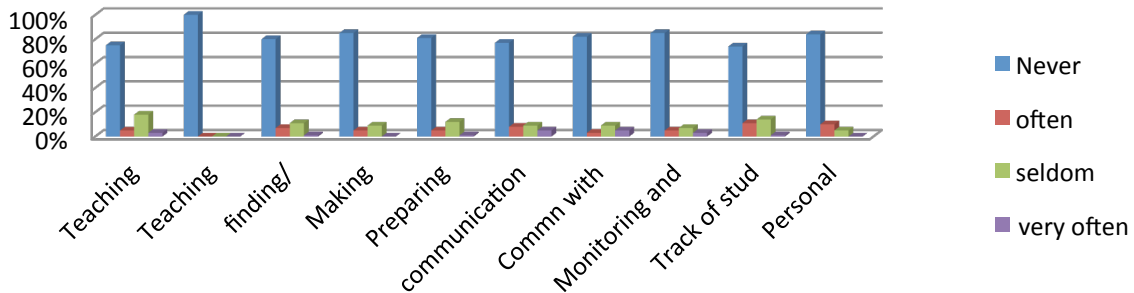
**Table: 10 – Non-Teaching Staff Trained in ICT**

<b>NON-TEACHING STAFF TRAINED IN ICT - GENDER WISE STATUS</b>				
<b>District Name</b>	<b>Non-Teaching</b>	<b>Non-Teaching</b>	<b>Non-Teaching</b>	<b>Non-Teaching</b>
	<b>Male</b>	<b>Female</b>	<b>Male trained</b>	<b>Female Trained</b>
<b>Chennai</b>	21	5	0	0
<b>Cuddalore</b>	21	14	0	0
<b>Thiruvannamalai</b>	19	3	0	0
<b>Villupuram</b>	38	7	0	0
<b>Coimbatore</b>	31	7	0	0
<b>Dharmapuri</b>	21	10	0	0
<b>Virudhunagar</b>	17	5	0	0
<b>Dindigul</b>	24	5	0	0
<b>Grand Total</b>	<b>99</b>	<b>29</b>	<b>0</b>	<b>0</b>

In none of the Schools have the non-teaching staff been given formal computer training. Mostly, the non-teaching staff doing the office / administration work possess basic computer knowledge. They have done computer courses in private computer centers. In several Schools, the Administration staff post is vacant and hence the teachers who possess some basic computer knowledge in computer usage especially the ICT teachers were engaged in doing the School Administration work part-time after their school hours.

**Graph: 2 Computer Usage of Non-ICT Teachers**

## Computer Usage of Non-ICT Teachers under different Parameters



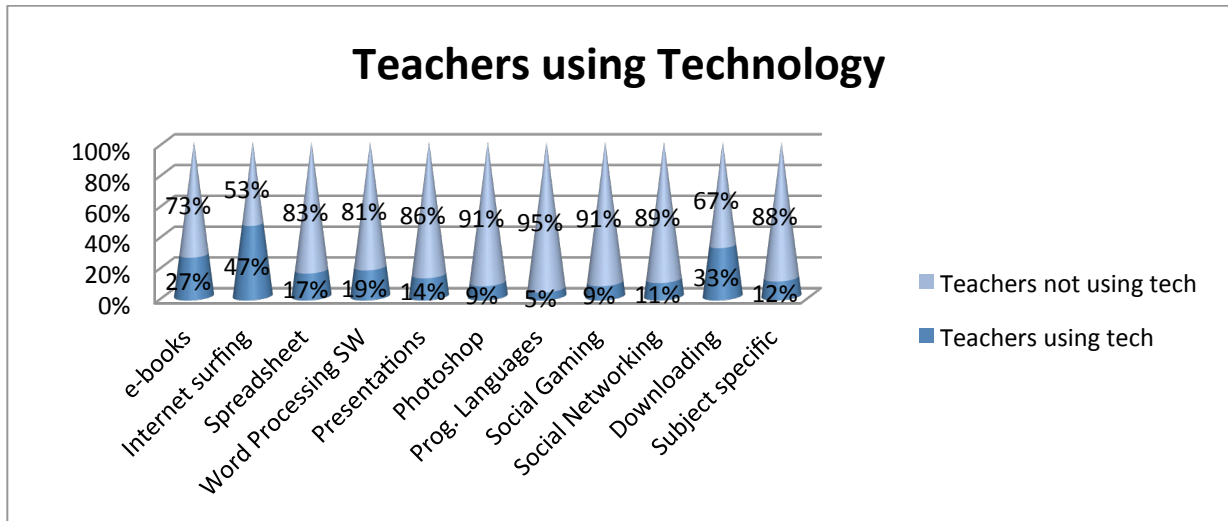
The Non-ICT teachers, though they are not restricted from access to computer or internet in the School, are unable to find time to use computers since they are too busy keeping up with the academic time-table.

Most of the Non-ICT teachers, nearly 70-80%, never use computer for any of the given parameters such as Teaching learning, teaching computer, finding or accessing information, making presentations, preparing lessons, communication with teachers, communication with parents, monitoring and evaluation of students' performance, track students' performance and preparation of report cards or even for their personal development.

Less than 10% teachers use computers often for finding/accessing information or for teaching learning. Only 1-5% teachers very often use computers under these parameters. However, these teachers use computer only at home and not in School. It was revealed by a few teachers that using computer in School is looked upon as non-official/personal work and hence teachers restrict themselves from using computers or internet inside School premises.

### 4.7 Teachers using Technology

Graph: 3 Teachers Using Technology

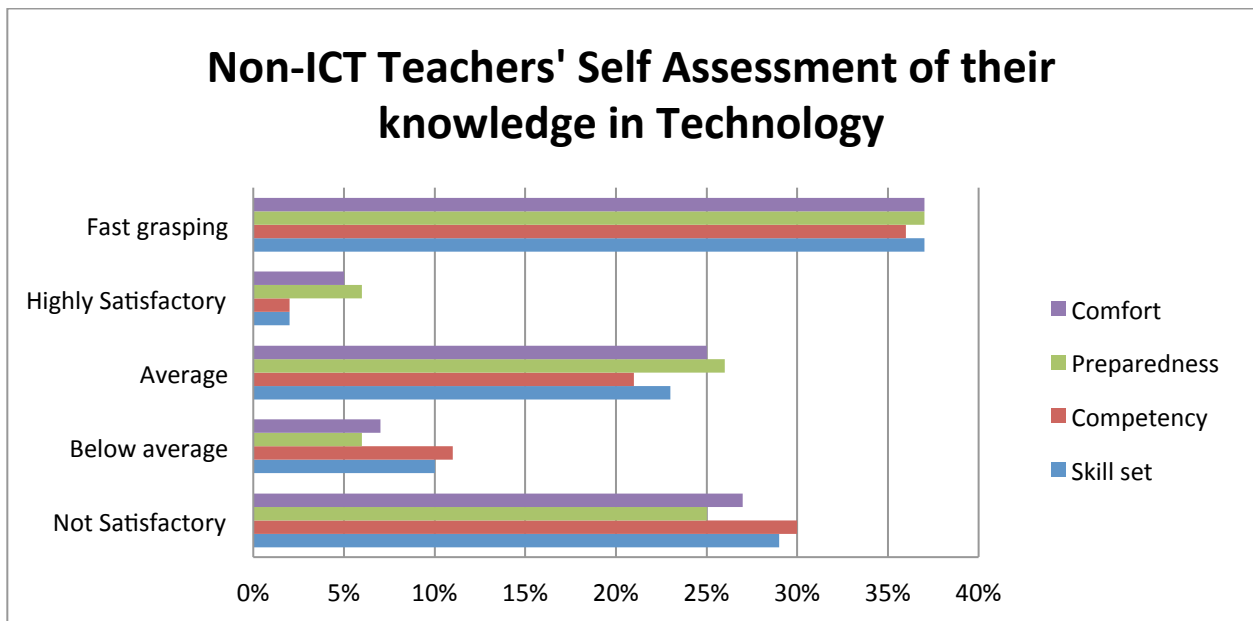


An average of 82% teachers are not using technology in their day to day activities. Only 18% teachers use technology in any of the above given activities. From the table, we can see that out of the 18% using technology, 27% are doing so to read e-books, 47% for internet surfing, 15-18% for excel spreadsheet, 11% for social networking, 33% download subject related articles from the internet, However, they all use computer and internet only at Home and not in School.

#### **Non-ICT Teachers Self Assessment of their Knowledge of Technology**

The Non-ICT teachers had been requested to do a Self Assessment of their knowledge of technology on their skill set, competency, preparedness and comfort level. The assessment options given were highly satisfactory, Not satisfactory, Average, Below Average and Fast grasping.`

**Graph: 4 – Non-ICT Teachers' Self Assessment of their Knowledge of Technology**



As far as the ICT skill set possessed by the non-ICT teachers in concerned, 37% said that they are fast grasping, 23% said they were Average, 10% stated they are below average and 29% said their knowledge was not Satisfactory. Only 2% teachers responded that they were highly satisfied with the skill set they possess in using technology.

For competency, preparedness and Comfort level in using technology, an average of 37% teachers responded that they are fast grasping. 26% teachers felt they are average, about 10% expressed they were below average and 30% are not satisfied with the level of competency, preparedness and comfort in using technology. Only about 5% teachers were confident in the level of competency, preparedness and comfortable in using technology.

### Non-ICT Teachers and Social Networking

**Table: 11 – Non-ICT Teachers having Personal Email ID**



Non-ICT Teachers having personal Email ID		
District	Yes	No
Chennai	59%	41%
Virudhunagar	40%	60%
Dharmapuri	37%	63%
Coimbatore	35%	65%
Dindigul	32%	68%
Cuddalore	29%	71%
Villupuram	24%	76%
Thiruvannamalai	19%	81%

The Non-ICT teachers' exposure to and interest in getting involved with social networking is very limited in rural districts when compared to urban. The usage of internet or email communication was found to be very low amongst the Non-ICT teachers.

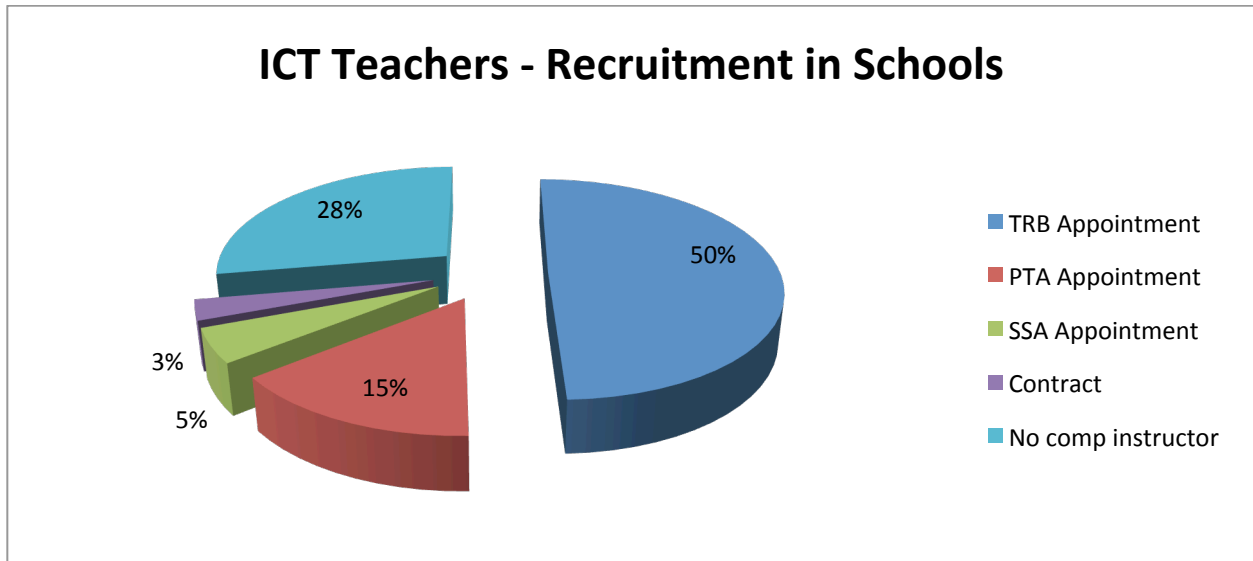
In Chennai, 59% teachers have a personal email id and 41% do not have a personal email id. In Virudhunagar 40%, in Dharmapuri 37%, Coimbatore 35%, Dindigul 32%, Cuddalore 29%, Villupuram 24% and Tiruvannamalai 19% teachers have a personal email ID. The remaining do not have an email ID or have not used any of the online communication possibilities. Most of the teachers who have an email ID are also not regularly using it. They do not have any links to social networking sites.

There are no teachers designated / appointed as "ICT Teacher" in any of the Government or Corporation Schools in Tamil Nadu. We have considered the computer teachers appointed to teach elective subject Computer Science for 11<sup>th</sup> and 12<sup>th</sup> Standards as ICT teacher. **However, Government Adi-dravida Welfare Schools do not have any provision to appoint a computer teacher.**

#### 4.8 ICT Teachers

##### ICT Teachers Appointment in Schools

**Diagram: 1 ICT Teachers Appointment in Schools**



50% ICT teachers were found to have been appointed through Teachers Recruitment Board (TRB), the Parent-Teachers' Associations (PTA) appoint teachers with the funds collected through their association. About 15% were appointed by PTA, SSA has appointed 5% teachers, 3% teachers were appointed on a contract basis. There were no computer instructors or teachers available in 28% schools.

Most of the ICT teachers hold a Master Degree in Computer Applications or Computer Science along with a B.Ed. qualification.

#### **4.9 Perception of Teachers Regarding ICT**

**Table: 12 Non-ICT Teachers response on technology Vs chalk and talk method**

<b>Non-ICT Teachers Response on Technology Vs. Chalk and Talk Method</b>				
<b>Response</b>	<b>Yes</b>	<b>No</b>	<b>Partially</b>	<b>No Idea</b>
<b>It promotes practical learning</b>	68%	6%	24%	2%
<b>It creates visual auditory impact</b>	82%	4%	12%	2%
<b>It encourages interactive learning</b>	62%	6%	31%	1%
<b>It saves time</b>	68%	7%	25%	0%
<b>Technology is cumbersome</b>	20%	29%	51%	0%
<b>difficult to use due to heterogeneity of students aptitude</b>	22%	30%	47%	0%
<b>Teaching with tech is not suited to Indian context</b>	16%	79%	5%	0%
<b>Technology can't replace chalk &amp; talk</b>	69%	25%	6%	0%

A majority of the Non-ICT teachers who responded to the question Technology Vs. Chalk and Talk method, agreed that Technology promotes practical learning, it creates visual auditory impact, it encourages interactive learning and that it saves time as well. 51% teachers responded that technology is partially cumbersome though it saves time. 47% felt that technology is partially difficult to use due to heterogeneity of the student's aptitude.

Significantly, 69% Non-ICT teachers argued that Technology cannot replace Chalk & Talk Method of teaching. This shows among the teachers a keen sense of wanting to combine the best of technology and the chalk and talk method.

79% teachers did not agree with the statement that teaching with technology doesn't suit the Indian context.

### **Perception of Non-ICT teachers on the effectiveness of technology in teaching subjects**

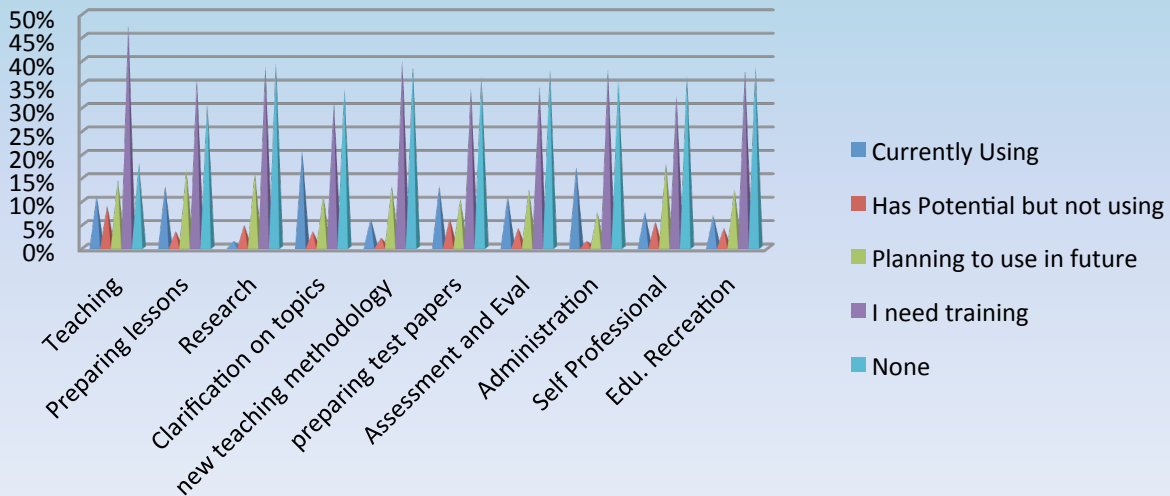
Table: 13 Perception of Non-ICT Teachers on the Effectiveness of Technology in Teaching Subjects

<b>Perception of Non-ICT teachers on the effectiveness of technology in teaching subjects</b>				
<b>Subjects</b>	<b>Effective</b>	<b>like chalk and talk method</b>	<b>Not Explored</b>	<b>Very Effective</b>
<b>English</b>	22%	5%	32%	41%
<b>Local language</b>	14%	1%	50%	34%
<b>Mathematics</b>	14%	5%	46%	35%
<b>Science</b>	15%	3%	42%	39%
<b>Accountancy</b>	16%	7%	52%	26%
<b>Social Sciences</b>	17%	6%	51%	26%
<b>Economics</b>	22%	5%	32%	41%

Most of the teachers responded that using technology in teaching English, Science and Economics will be comparatively very effective. Less than 10% stated that technology is more like chalk and talk method. About 60% teachers responded that they were unable to give an opinion since they haven't explored using technology in teaching.

Figure : 9 Non-ICT teachers response towards using technology in different ways

## NON-ICT TEACHERS RESPONSE TOWARDS USING TECHNOLOGY IN DIFFERENT WAYS



Majority of the teachers are not using technology for different purposes such as teaching, preparing lessons, research, and clarification on topics, new teaching methodology, preparing test papers, assessment and evaluation, administration work, self professional development or for their educational recreation. The table above explains the usage of technology by teachers for different scopes.

### NON-ICT TEACHERS RESPONSE ON THE CAPACITY OF STUDENTS IN USING TECHNOLOGY

**Table: 14 Non-ICT Teachers response on the capacity of students in using Technology**

Non-ICT teachers response on the capacity of students in using technology				
Row Labels	Skill	Competency	Preparedness	Comfort
Highly Satisfactory	9%	4%	5%	6%
satisfactory	19%	16%	15%	15%
Average	27%	30%	34%	29%
Below Average	6%	7%	9%	9%
not satisfactory	6%	6%	6%	6%
<b>Fast Grasping</b>	<b>34%</b>	<b>36%</b>	<b>31%</b>	<b>35%</b>

The Non-ICT teachers responded on the capacity of students in using technology. An average of 35% teachers stated that the students are really fast grasping in learning the technology. 30% teachers felt that the skill set, competency, preparedness and comfort level of the students are

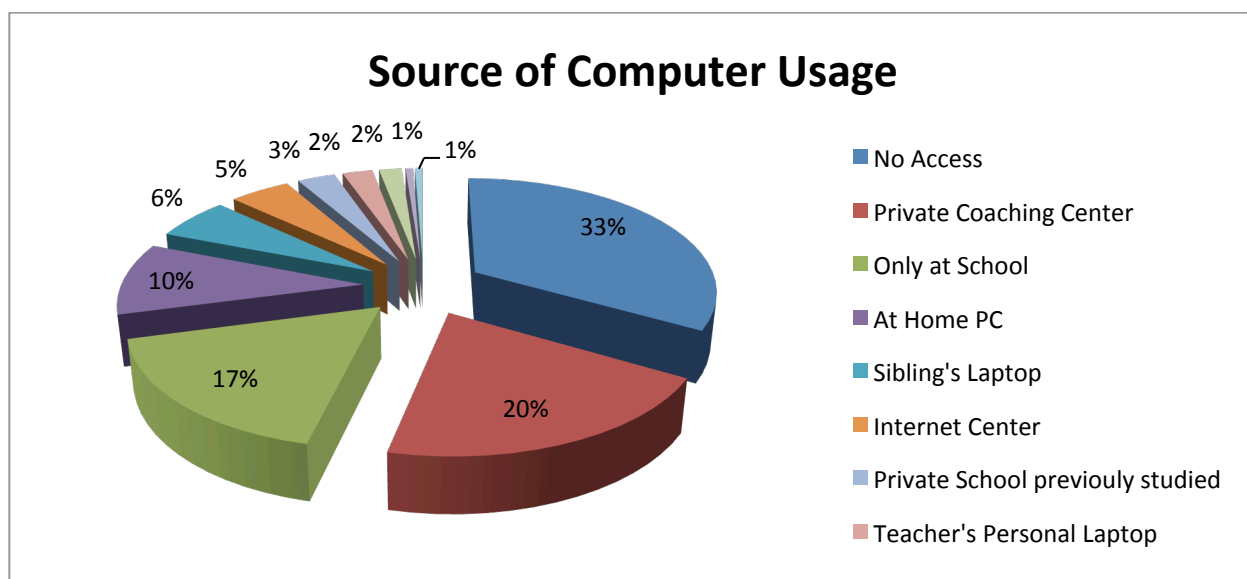
average and most of the teachers responded that the capacity of students in using technology is satisfactory.

#### 4.10 Students

The response of the Students has been taken as one of the important components in the evaluation of ICT implementation. As seen earlier, in most schools computer science is not taught as a Subject from 6<sup>th</sup> to 10<sup>th</sup> standard. Also, ICT is not being used in teaching other subjects.

However, Students are curious and enthusiastic about learning computers. The questions posed to them were intended to know their skills, interest, access to use computers and also a self-assessment of their level of skill in computer applications.

**Diagram: 6 Students' Access to Computers**



In most of the Schools, Students have not had enough opportunity to use computers at the middle school level (Classes IX & X). At Primary level (classes I to VIII), Sarva Shiksha Abhiyan (SSA) instituted CAL centers active in some of the Schools provide access to computers. In case of higher secondary level, students who have taken computer science as elective subject were able to use the computer lab for practical sessions. There is no access for the other students.

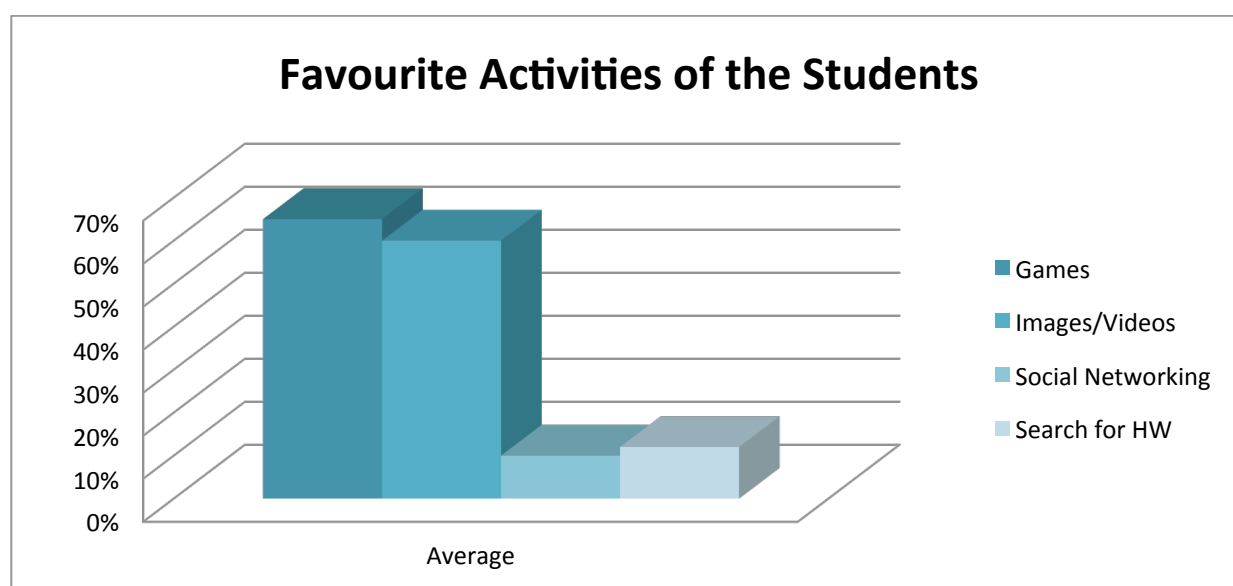
Students have the curiosity and look for an opportunity to access computers. 38% students have no option other than school and hence their access becomes very limited. 25% of the students stated that they never had an opportunity to even touch the computer. They do not have access either at

school or at any private computer center. It is not affordable for several students to go to private computer/browsing centers to learn or access computers.

18% students have attended few short courses in private coaching centers. The siblings of a few students have got the Government of Tamil Nadu free lap top. 3% students have accessed their sibling’s laptop. 1% students have accessed computer rarely at relative’s house, teachers’ laptop or in the private school in which they previously studied.

### **Favorite Activities of the Students**

Diagram: 7 Favorite Activities of Students



The Students who have access to computer in private centers or friend’s house mainly play games on computers. 65% students have responded that they play downloaded games on computers whenever they get access to use. 60% watch images and videos and 10% use it for social networking which can be seen only in urban districts. 12% students search for information to do Home Work or for other extracurricular activities. In Government Higher Secondary School, Choolaimedu, the HM motivates the students to participate in extracurricular activities like speech competition, drawing competition, poem reciting competition, etc. The HM himself searches online for such announcements and makes the students participate to give them some exposure.

### **Self Assessment on Students’ Level of Skill in Computer Applications**

**Table: 15 Self Assessment on the Students’ Level of Skill in Computer Applications**

SELF ASSESSMENT ON STUDENTS' LEVEL OF SKILL IN COMPUTER APPLICATIONS					
District	Excellent	Good	Average	Bad	Grand Total
Chennai	6	23	42	10	80
Cuddalore	0	6	24	50	80
Thiruvannamalai	0	0	18	62	80
Villupuram	4	18	29	29	80
Coimbatore	0	32	46	2	80
Dindigul	1	16	34	29	80
Virudhunagar	4	11	26	39	80
Dharmapuri	1	8	28	43	80
<b>Grand Total</b>	<b>16</b>	<b>114</b>	<b>247</b>	<b>263</b>	<b>640</b>

41% students felt their level of skill in computer applications was “Bad” while 39% it was average. The students also added that they do not get enough opportunity to access a computer. Also in schools they felt they were not given enough opportunity during practical sessions. The students expressed a clear need of computer access in school. Only 20% of students assessed their computer skills as “good” or “excellent”.

**Table: 16 Purpose and Frequency of using ICT Tool by Students**

PURPOSE AND FREQUENCY OF USING ICT TOOL BY STUDENTS					
Purpose	Very Often	Often	Sometimes	Rarely	Not at all
Informative	8%	14%	10%	5%	63%
Functional	5%	9%	14%	4%	68%
Creative	4%	11%	10%	6%	70%

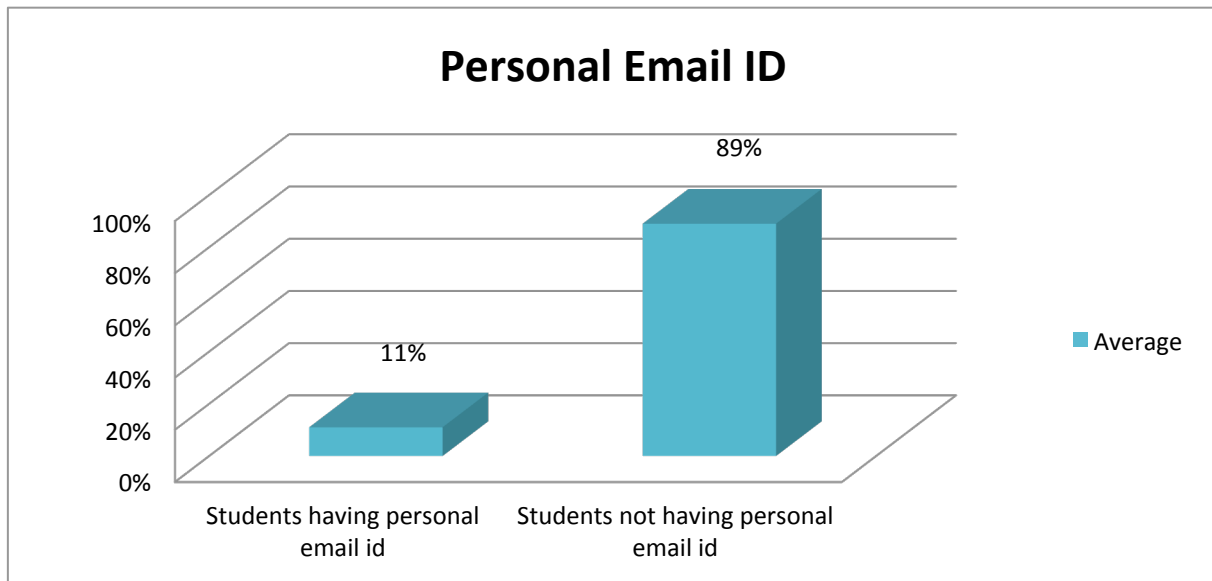
The purpose and frequency of using ICT tool by students were classified under three heads viz, Informative, Functional and Creativity.

63% never use computer for informative purpose, 68% never use for functional and 70% students never use for creativity purposes. 10-14% Students use sometimes and less than 8% very often use computer for these 3 activities. 14% often use computer for informative, 9% for functional and 11% for creativity purposes.

#### **Students Having Personal Email Id**

Diagram: 4 Students having personal Email ID





89% of the Students do not have a personal email id. The students have never attempted any communication through emails. From among 11% of the students who have a personal email Id, very few have ever used it at all. Most of the students have not done any social networking via computer/internet.

#### 4.11 Summary of Observations:

- The Enrollment pattern in the surveyed schools comprises an average of 63% in General category, 32% in SC category and 5% ST category.
- In Tamil Nadu, there is no separate department known as ICT department in schools. The computer Labs are considered as ICT department.
- Computer Lab is available in 100% of the schools visited in Chennai, Cuddalore, Villupuram and Virudhunagar districts, 90% of the schools in Thiruvannamalai, Dharmapuri and Dindigul districts and 70% Schools in Coimbatore district. In almost all the Schools, the computer labs are used only by the 11<sup>th</sup> and 12<sup>th</sup> standard students who have taken Computer Science as elective subject. In Virudhunagar district, though the labs are available in 100% Schools, only 50% schools use the computer lab and the remaining Schools have kept the computer rooms locked. Also, in Dharmapuri, Villupuram and Dindigul the computer labs are used occasionally.
- In Cuddalore and Chennai districts, the ICT intervention has started early in the years 1986 and 1997 respectively. In other districts, ICT intervention was during the period 2005-2007.
- There are projectors available in 98% Schools but only in 59% Schools the projectors are in working condition.
- ICT is taught as a subject only at the Higher Secondary Level in 100% schools but only for those students who have opted for computer science as their elective subject. The usage of computer lab is restricted only to these students.
- The Non-ICT teachers have been given minimum computer training on the basics, MS office and internet usage. Most of the trainings were organized by State SSA authorities and hence had been given only to the Secondary Grade teachers. However, there were no practical sessions conducted during the training. Also, after the training, teachers had no opportunity to use computers due to their packed academic schedule in teaching the regular subjects. None of the PG teachers have been given basic training in computers.

- In several Schools, the Administrative Staff post is vacant; the teachers who possess some basic computer knowledge, especially the ICT teachers, were engaged in doing the School Administration work part-time after their school hours. The vacancy in non-teaching staff position needs to be addressed on an urgent basis. There are no ICT teachers appointed in any of the Government or Corporation Schools in Tamil Nadu. We have considered the computer teachers appointed to teach elective subject Computer Science for 11<sup>th</sup> and 12<sup>th</sup> Standards as ICT teacher. However, Government Adi-Dravida Welfare Schools do not have any provision to appoint a computer teacher.
- An average of 82% teachers are not using technology in their day to day activities. From the tables we can see that out of the 18% (58/320) who use it, 27% teachers use technology to read e-books, 47% for internet surfing, 15-18% use excel spreadsheet, 11% use it for social networking, 33% download subject related articles from the internet, etc. However, they all use computer and internet only at home and not in school.
- In most of the schools, students have not had the opportunity to use computers at the high school level from 8<sup>th</sup> to 10<sup>th</sup> standard. At Primary level, they do have CAL centers active in some of the schools, which provide access to computers. At higher secondary level, students who have taken computer science as elective subject were able to use the computer lab for practical sessions. The remaining students do not have access to use computers.
- Majority of the Non-ICT teachers agreed that Technology promotes practical learning, it creates visual auditory impact, it encourages interactive learning and that it saves time as well. 47% felt that technology is partially difficult to use due to heterogeneity of the Students' aptitude. 69% non-ICT teachers argued that Technology cannot replace Chalk & Talk Method of teaching. 79% teachers disagreed with the statement that teaching with technology doesn't suit the Indian context.
- The major factors that affect ICT implementation could be listed as
  - Non-Availability of ICT material to teach subjects
  - Lack of Awareness amongst the teachers regarding usage of ICT in teaching subject
  - Majority of PG teachers do not have basic knowledge of computers and lack training

- Underutilization of existing ICT tools
  - Non allocation of recurring or maintenance expenditure in the School Budget
  - Economic condition of the students determines their ICT exposure
- There is a request from all the School HMs and Teachers regarding setting up of common service centers for the repairs and maintenance of ICT tools.

The next chapter – Chapter 5 – deals with the qualitative assessment and evaluation of ICT implementation in the Schools in Tamil Nadu.

## **CHAPTER 5**

## **ICT IN TAMIL NADU: A QUALITATIVE ASSESSMENT**

### **5.1 Introduction**

A summary of the ICT scheme (Chapter 3) based on the four assessment factors – Infrastructure, Curriculum, Educators and Students - shed light on the progress of the scheme in the government schools of Tamil Nadu. This chapter attempts to corroborate that data on the basis of Field

Interviews and Focus Group Discussions (FGDs) conducted at the grass root levels. Basically the ICT scheme as defined by the MHRD is also a proposal of state-society collaborative effort inviting the participation of the local community. It is thus essential to explore the field discussions at length as grass root perspectives and observations serve as vital policy suggestions towards fostering technology based education.

## **5.2 Grass root Response to ICT in School Education: Perspectives from below**

As per the ToR guidelines, two important tools of assessment that were used to support our qualitative study were Field interviews and Focus Group Discussions. At the School level, our focus group members were HMs of the schools, ICT teachers (1teacher per school), non-ICT teachers (4 teachers per school) and the students (8 students per school). Interviews and FGDs were conducted in selected Secondary and Higher Secondary Government/Government aided/Corporation schools in the 8 districts of Tamil Nadu. Interestingly, the four assessment factors (mentioned above) were culled out from the extensive interaction of the team with the focus group.

### **Field Report: Highlights**

- **The school viewpoints are presented taking into account both formal (field) interviews and deliberations during FGDs.**
- **Estimation/grading tools (drawn from MHRD questionnaire) have been used both by the interviewers and the respondents.**
- **The statements of the HMs/ ICT & NON-ICT TEACHERS/STUDENTS are quoted where needed**
- **Case examples are discussed to present the grass root situation.**
- **District Progress Report is enclosed to highlight the implementation status of the ICT scheme at present and the requirements for future progress.**

Integral to this intensive school level survey had been the focus group discussion with the teachers who play a vital role in stimulating ICT environment in school. Alongside equipping themselves in the use of computer technology, they are the ones who are continually aware of the skill set and motivation levels of students. Further, they function as the nodal agents upon whom the school authorities (HM) and even district level authorities (CEOs) rely, to a great extent, in the context of mapping the ICT requirements in school.

It is seen from the policy notes and model bid documents<sup>32</sup> that the scheme is supported substantially by the Central and State governments and there is a component-wise financial allocation to support the training and infrastructural requirements of the initiative. It is thus essential to study the conditions prevalent in ICT schools. FGDs provided the platform to gauge the effectiveness of state support and the school proficiency in the mission of fostering the ICT awareness and usage in government schools.

Discussion with the school level functionaries was an eye-opener on in many ways. On the one hand, teachers were aware of the significance of ICT in the education system and had a lot to share. Many were able to clearly identify the hurdles in implementation - school-specific and even in larger perspectives, be it infrastructural arrangements, including contract renewals and compliance with Service Level Agreements, (SLA), or the design of e-content by the teacher or prepared commercially by third party. The need for updating and streamlining the ICT package at regular intervals was strongly pointed out by the teachers during the discussion. Despite their awareness, the teachers' involvement in the technical components of ICT package and contractual dealings was low, and their preparedness and competency varied between schools/districts.

The survey target was to have effectively 5 FGDs, covering 5 of the 10 schools per district. Broadly, our interaction covered certain specific issues the members came up with alongside a structured questionnaire comprising of 21 questions, which had a blend of quantitative and qualitative aspects. This apart, the informal talks we had with the teachers beyond the interview mandates are also recorded as some of them were earnest pleas.

Preparedness for and use of computer technology in school for academic and administrative work was taken to be synonymous with ICT implementation in this survey. We began our interview posing a quiz to students on the expansion of the short form of ICT, and with some prompting and clues, a few managed to guess what it stands for. . Though the structured questionnaire was used for FGD, the discussions went beyond that.

### **5.3 District Progress Report**

---

<sup>32</sup> MHRD sources like ([www.iforchange.org](http://www.iforchange.org)) National Policy on Information and Communication Technology (ICT) in School Education (2012), (<http://mhrd.gov.in>) Implementation of the ICT @Schools Scheme: Model Bid Document to mention a few, were consulted.

Based on the interactions with the school team - HMs, the ICT & non-ICT teachers and students on ICT programme in school, district profile is presented.

First, we have the aspects common to all districts followed by district progress reports.

ICT does make a difference in the overall learning ability of the students, not as a replacement to chalk and talk method, but as a meaningful supplement.

- Visual medium of presentation, lab sessions for language (mainly English grammar and vocabulary) and technology based projects/ assignments/ events in school mark the beginning of ICT enabled education in schools.
- There is a realization that ICT based curriculum has the merit of enhancing students' interest in academic learning.
- Teachers feel that school attendance and exam performance of the students would go up eventually under the new system.
- Though the staff showed no gender distinction while rating the enthusiasm of their students in use of computer technology, our interaction with students showed girls to be serious (using technology for scholastic and non-scholastic activities) and boys curious (using technology to learn different technical operations) in the use of computer technology.
- Students are more aware of and use computers and the internet more for entertainment rather than academic activities.
- While well-qualified ICT teachers seem to be the resource persons through whom the ICT programme can be made to work, we find quite a number of non-ICT staff currently using or planning to use ICT for research, education, recreation, as an evaluation tool and working on new teaching methodology. The training needs of such staff merits specific attention as non-ICT teachers in all schools said that they have not undergone ICT specific training.
- Absence of school budget and expiry of service contracts were found to be serious limitations. As a result, unattended repairs in basic ICT facilities disrupted the use of computer technology. In most schools, there was an urgent need for renewal of service contracts or signing new agreements. On-site technical support and monitoring by computer teacher also need to improve.
- Need for hardware and software engineers were emphasized in all schools; in addition, safety and security concerns were expressed by the HM and staff.
- While the ICT teachers and staff do not get involved in school contractual dealings with computer agencies, the non-ICT are totally unaware of the technical and financial aspects of such dealings. It was felt that technical and financial components of ICT service contracts can be left to technically sound ICT and non-ICT teachers under the supervision of school HM; as



some teachers have good knowledge of computer technology, it is vital to use their potential in ICT activities in school.

- Communication between schools and the district authorities is only for getting educational material, hardware repair and so on. There is no 2-way communication about concerns regarding the overall ICT programme and its progress. The computerization of MIS data has not happened in most schools.
- Link between schools of the neighborhood, the undercurrent of smart model, is not found. As far as intra school relationship is concerned while HMs, teachers and students had their own grievances, the understanding among teachers and between the HM and teachers is fairly good.

### **District highlights:**

#### **Chennai**

- Computer/ internet based assignments were popular in most of the schools.
- Computerization of office work was highlighted as one of the 4 achievements; but it was confined to data entry work and yet to be used as an evaluation tool.
- With Internet centres near their homes (unlike remote districts where centres were located quite far away), the students' visit them frequently.
- In terms of competency and comfort levels, teachers demand training, while students need easy access to school computer/net with an increase in assignments/projects using computer. It is learnt that Nokia, as part of its promotional package had a tie-up with the schools across districts (Chennai mainly), in organising audio sessions in English (grammar and vocabulary).
- Though academic use of computer technology by students was visibly less, enthusiastic promotion by teachers and HMs, for scholastic and non-scholastic activities was observed. Specifically, co-curricular assignments were used as means of drawing students attention towards productive use of technology.

#### **Villupuram**

- Two types of schools were found in Villupuram: one where awareness and usage absolutely was nil and the other where we could find teachers proficient in not less than 3 ICT tools.
- In potential schools, awareness on the significance of ICT in school curriculum was high contrary to our expectation that rural schools may prefer chalk and talk method. It is not merely awareness, but the preparedness and comfort levels of both ICT and non-ICT staff

were found striking as they explained the use of ICT tools (like coral draw, subject-specific handhelds) in their subject.

- It is not surprising (though not encouraging) to note the rare use of visual method in teaching, which is attributed to lack of supportive school environment. The socio-economic background of students in rural schools shed light on the need for computer/net accessibility in schools as visiting internet centres is beyond their financial capacity.
- As assignments/projects were not given to students, the use of computer technology for academic purposes was found to be very low. But their enthusiastic response to AV sessions, visit to net centres and preparedness to learn computer as observed by the staff serve as an assurance of students' participation if ICT is inducted in a comprehensive way.

### **Thiruvannamalai**

- It was encouraging to note the impact of visual medium of teaching in schools despite the fact that the use of computer technology was not significant as compared to other districts.
- Use of ICT in academic teaching was suggested by teachers who are keen on AV session (atleast once in a while) to handle complex topics. The practical knowledge of some teachers on subject-specific applications invites attention. To quote an example, a Maths teacher explained how the visual medium is helpful in teaching trigonometry and theoretical geometry.
- Students had learnt some technical operations (downloading, image editing, data storing, voice recording) from mobile phones and showed competency in basic computer applications.
- Awareness and enthusiasm was found as teachers and students show potential to get trained in ICT curriculum.
- Many schools were found extremely lacking in basic ICT infrastructure and showed a list of specific requirements (language lab, e-board and power back up).

### **Cuddalore**

- In Cuddalore schools, increasing awareness could be observed on use of ICT in school education. Experiments in some schools—academic and administration - indicated the growing trend. Office work relating to smart card tasks and e-nominal rolls was done more comprehensively.

- Non- ICT teachers skilled in subject specific applications were conducting AV sessions in many schools. They saw to it that practical subjects (like global warming) are taught using visual medium.
- Computer instructors argued for the need for a complete re-structuring as in their opinion the schools were far from being fully ICT enabled.
- ICT training to staffs and recruitment of service engineers was pointed out as crucial requirements in schools.
- It was observed in few schools that “average and below average’ category were the targeted segments. So, individual systems for students during computer period, easy accessibility during free periods and out of school hours were seen as essential towards progressive use of technology in school assignments.

### **Dindigul**

- In dindigul, the inventory report of many schools showed the availability of ICT tools, as the school authorities explained the importance of these teaching aids (for e.g. laptop dual core@, CD/DVD COMBO, N/W cabling, I/O Box, UPS, Linux server to mention a few).
- Preference for chalk and talk method was also found. Yet, schools have taken to technology based education as they envision a smart school system in the near future. Awareness is quite high.
- ICT training for teachers is considered as an integral component of the technology based education system. Teachers in many schools have participated in training programmes organised by local engineering colleges along with those conducted by SSA and RMSA.
- The ICT potential of the students was evident as some of them were undergoing private computer courses (DCA) with training in MS-OFFICE applications. Lack of access in schools was put forth as a major hurdle by the students.

### **Dharmapuri**

- Computer technology was used effectively as a data entry tool and new packages like “Sindhiya” software have been tried.
- Awareness on ICT programme greatly varied from school to school. In some schools AV modules were used for teaching complex topics and explaining social issues (e.g. themes for

AV class: prohibition of smoking, awareness on HIV/AIDS, significance of nutrition to mention a few). In many other schools ICT had not begun.

- Teachers in many schools cited lack of preparedness for technology based education in terms of ICT environment in schools.
- Heads of the schools suggested 'after school' learning for teachers assuring availability of computer.
- There was a serious demand for core and enabling infrastructure in many schools. Three phase EB connection and computers with net connection was put forth as minimum requirement by the ICT and non-ICT teachers.
- In Corporation schools, smart curriculum was found to be expanding in terms of infrastructure, teachers' involvement and schools' coordination with the government and the local public. Members of the public and parents were a part of the smart scheme through whose support the schools gets things done.
- They were emerging as model ICT schools. These schools have been able to explore lucrative options. For instance the computer instructor in one of the Corporation schools of the district suggested that instead of complaining about service agencies (including ELCOT/any private mechanism) they prefer AMC with local agencies which includes 3-4 servicing in a year tagged with annual renewal of contracts. Also, if either of the parties is not satisfied, they may withdraw from the deal with a formal notification.
- Some schools which were centers for TET, TNPSC have tried ICT applications while conducting these exams.

### **Virudhunagar**

- In many schools core and enabling infrastructure towards ICT application was not available; also the frequency of fault occurrences in supportive tools was high. Erratic power supply was one of the serious concerns.
- A few schools have not got educational materials (CDs) from RMSA.
- Use of home computers and personal data cards by teachers was found in many schools, though the teachers expressed the need for facilities in school.
- Teachers observed that ICT as a teaching aid is difficult owing to differences in competency and skill sets of the students. Nonetheless, innovative practices found in few schools showed the prospects of ICT in school education. (for e.g. using visual medium to teach Tamil.

- Students' visits to internet centers were becoming popular. Students in many schools noted that after their computer training in primary classes, private learning was their main source. They argued for the need for sufficient facilities in schools as private learning is expensive.

#### 5.4 Infrastructure: School as an ICT Site

*“Technology helps us to teach in an easy way. The students are eager to learn the lessons...They are also interested to learn ICT” – Dharmapuri school teacher.*

*“What we now have is a normal class room for computer sessions; give us a separate ICT lab with LAN connections, UPS (10 KV), multi media like web camera, WIFI connection...” – Cuddalore school teacher*

**Schools across districts are ready and willing to take to technology based curriculum in a serious way, highlighting the need including power back up systems and provision for regular maintenance and repair.**

Infrastructure is one of the pre-requisites for successful implementation of ICT in school programme. According to the Model Bid Document (MHRD)<sup>33</sup> the technical components of ICT plan not only encompass a wide range of accessories, both hardware and software, but also include planning of infrastructural layout, and assurance on supportive services including uninterrupted power supply, broadband connections, internet nodes and the digital kit comprising of projectors, printers, scanners etc. On the specifics of ICT inventory policy, it is seen that creation of sound ICT environment in school in terms of accessibility and sufficiency is emphasized. As such, the scheme rules out any situation of disruption in technical services as alternative arrangements are also spelt out. An extract from the 'Amended Guidelines of ICT in Schools Scheme on 21.02.2011', MHRD<sup>34</sup>, is presented below:

- “Hardware and software: Each school would be provided with 10 PCs or 10 nodes connected through a server. Accessories like printers, projection system, etc will also be provided.

<sup>33</sup> [www.mhrd.gov.in](http://www.mhrd.gov.in): Implementation of the ICT @ Schools Scheme: Model Bid Document, Department of School Education and Literacy, Ministry of Human Resource Development, Government of India.

<sup>34</sup> Revised Scheme of Information and Communication Technology in Schools (ICT in Schools) during the XI Plan.

- Keyboards would be customized for use in the regional languages.
- Connectivity: The first priority would be to have a broadband internet connection of at least 2 MBPS bandwidth in each school. Wherever that is not possible, connection of lower bandwidth would be provided with plan to upgrade in future. Wireless links would also be explored.
- Power Supply: Wherever the power supply is unreliable, it is proposed to provide assistance for purchase of a generator, as a back up only and also its recurring cost, subject to a maximum of Rs.1000 per month, in addition to Rs 1000 per month for the electricity charges. In areas where there is no power supply, solar generated power should be made use of.
- Computer Room/Lab: The computers would be installed in one of the safe rooms in the school. If such rooms are not available, the need can be met from the scheme Rashtriya Madhyamik Shiksha Abhiyan (RMSA) in case of Government schools”.

At the school level there was no awareness of the provisions of the ICT scheme.

Some observations from our school visits:

- In terms of basic infrastructure and ICT kit in schools, almost all schools had AV LAB and/Computer lab.
- The HM room and office room had a system with net connection.
- Many schools have started with the visual medium of presentation as a teaching aid.
- There is a general consensus in schools on the enhanced use of computer technology in school assignments.
- Though problems relating to infrastructure were observed in all the 8 districts, there is diversity in how the schools deal with the infrastructural challenges depending upon their location - rural/urban and collaboration – intra & inter school.

In the context of ICT environment in schools, the key issues are:

- Firstly, more PCs and supportive tools are needed
- Second, the need for better maintenance of the labs and tools
- Third, renewal of service agreements and strengthening of security arrangements

For ICT application in schools, enabling environment is essential. It was found that none of the schools had an ICT department (Table 3). Though computer lab was available in all schools, the availability and working condition of ICT tools was far from satisfactory. While basic tools like PCs,

laptops, UPS, projectors and printers, to name a few, were found in the schools, many of these were not in working condition; particularly laptop and projector were found under repair in many schools (Table 5). ICT teachers in many schools complained that their school did not have gadgets like scanner, web camera and modem. One consoling factor was that all schools had server with terminals and broadband antenna (100%) in working condition (Table 5).

A long list of problems as narrated by a computer instructor sums up the plight of ICT environment in schools:

#### **Infrastructural bottlenecks: Teacher's report**

“Computer lab has few facilities; even the floors is not good and has no tiles; no fans in lab; lab is not well maintained; more systems with net connections are needed; hardware problems always go unattended; One computer lab is not sufficient; software kit is not available; printer is not in working condition and we have no scanner; UPS is not working;; multi- media projector is very much essential; mother board which was sent for repair to original company (in 2010) has not been delivered back to us and no response from company; with such challenges it is really difficult to implement ICT in our school”. Another staff member intervened saying “Teachers’ recommendations are not given serious consideration by educational authorities”- Dharmapuri school.

When asked about absence of air conditioners and haphazard seating arrangements, computer staff replied that it was due to the use of lab for theory classes as well and many even complained about the congestion in the labs and poor student-system ratio. While some HMs cited financial constraints as reasons, the need for renewing maintenance contracts never merited serious attention. Computer teachers admitted that during practical exams, computer breakdowns were a common phenomenon, and they resorted to temporary arrangements and were using their resources to address the crisis.

They had no proper response for questions such as - Who were their AMC agencies? What about their service contracts – ELCOT or any other and where the solution lies? “*It is all a government matter*” was the most common reply in schools.

Safety of computer gadgets was one among the primary issues that were discussed. One can never forget the case of a Chennai school in which the computer lab was completely looted and after possible replacements the school authorities had to double lock the room. Both the HM and

teachers in almost all schools emphasized the need for proper security arrangements from the Government.

Responses from schools to questions about infrastructure, technical support and curricular integration were varied.

During the FGDs, ICT and non-ICT teachers in most schools pointed out that infrastructural problems including insufficiency of tools, frequent breakdowns, congestion in labs, poor security arrangements affected ICT applications in the school in several ways:

- AV sessions (English) which started off very well were discontinued in schools (all districts).
- Power point presentations (all subjects) by teachers and computer based project work – curricular and
- co-curricular - could not be scheduled in the time table (Chennai schools).
- CS group students had limited hours of practical classes (all districts)

Though the primary objective of ICT intervention was to cover the remote/isolated regions, the field findings show that the situation is not satisfactory in districts like Dharmapuri (characterised as backward by the state), Thiruvannamalai (region of lower tele-density) and Virudhunagar (district with electricity problems). In many schools of these districts there was no computer based activity. This was not due to non-awareness of ICT, but the poor environment in schools, and their remoteness.

**Coordination within the school (Virudhunagar):** Despite the infrastructural constraints, visual presentations were started on an experimental basis in one of the schools of the district.

Materials were procured from third parties for teaching language and value education skills. PPTs were used once in a while in subjects including Science, Social Science and Tamil for students of class VI –VIII.

HM and computer teacher decided upon private arrangements to take charge of ICT support in school for Repairs & Maintenance (R & M), installing inverter etc. The school had no external aid or onsite technical support. But the coordination within the school was impressive.

From the views of the computer instructor of the school it was clear that the rapport between the ICT and non-ICT staff was good. When there was work pressure on the admin front, the respective teachers offered possible help to the computer teacher so that the e-work gets done. What was



even more surprising in case of this school was that their contact with district education office was quite smooth as the computer instructor noted. The school saw this link as a channel of getting support for ICT.

**Coordination with district and state offices (Dindigul):** Highlighting the importance of infrastructure for ICT enabled education, in one of the schools, the authorities showed us the inventory report.

According to the Systems Inventory Report, issued by the DSE, government of Tamil Nadu, an exhaustive list of ICT tools<sup>35</sup> had been supplied and found to be in working condition in Dindigul school. Regarding R&M, the school was able to mobilize private support through financial support from RMSA.

These achievements of the school were possible not merely with providing of tools, but the sustained efforts of the school to co-ordinate with district and state level authorities. The HM noted that the good rapport with the monitoring authorities - SSA, DSE and Dept. of MBC & DNC, enabled development of ICT environment in the school.

**Corporation Model School (Coimbatore):** A Corporation run school of this district had smart class equipment computers, touch screen monitor (standing), smart board, projector, speakers with mike, 5 KVA UPS. During the time of visit, smart session was going on. The HM who was available for interaction noted that, "Through the support of Corporation, our school got the smart tools. We were motivated to follow smart curriculum for students of class VI-XII...The local people help our school in all possible ways in getting government aid...Moreover, Head, PTA, is very helpful".

### **Efforts by the Individuals Schools: An Extract from School Survey**

Thus, an increasing awareness of the significance of Smart class was observed both in urban and rural schools. Field visits to remote schools (for e.g. Dharmapuri<sup>36</sup>, Dindigul) revealed that schools were preparing for technology based education; to quote a *teacher* "...Now this world is computer-oriented. So in future all schools will shift to smart system"; the schools have no option but to prepare for digital sessions in terms of infrastructure and teacher training in academic applications" (Dindigul School).

### **5.5 ICT Curriculum: Going beyond Computer Literacy Programme**

---

<sup>35</sup> Laptop dual core@ GB/DVD COMBO, LCD projector, DM printer, N/W cabling, I/O Box, UPS, RED HAT, Linux server, pen drive.

<sup>36</sup> In one of the schools, the school authorities pointed out that 23 computer accessories were obtained in 2007 and internet connection was procured in 2010.

The objective of ICT curriculum is to emphasize the constructive use of technology by students in scholastic and non-scholastic activities in school. MHRD stresses upon innovations in “Content Development” as a crucial component of ICT education, which is done at the national and state level initially and envisaged as a school level task after the school undergoes comprehensive ICT training.

Presently, the academic level offering of ICT in schools is very limited at Primary and Secondary levels (Table 8). At the Higher Secondary level the academic level offering was found to be 100% (Table 8). The team wanted to know what this 100% offering meant and also to explore the actual application in schools. From the field responses **four observations** (common to all districts) could be made:

### ICT application in schools: Current Situation

○ First, XI & XII students had ICT as an elective subject which is syllabus-based.
○ Second, wherever ICT/computer based teaching had begun, use of educational CDs as teaching aid was found though the AV sessions were not scheduled as part of normal time table
○ Third, computer-based assignments (scholastic and non-scholastic) for students were becoming popular in schools.
○ Fourth, use of computer in administration work (e.g. mark entry, attendance maintenance) was found in almost all schools.

We found that mainly academic initiatives in schools under ICT curriculum meant Computer Science course (CS) for XI & XII students. The team had elaborate discussions with ICT teachers handling CS sessions to know how they were conducted. A couple of issues were put forth by the teachers.

First, regarding interesting and innovative use of ICT (following MHRD guidelines<sup>37</sup>), like airing Gyan Vani, AIR educational programmes and/or designing their own digital programmes, the teachers in all schools came out with the fact they were totally engaged in training students in syllabus-related topics (C++, LINUX, HTML). An enthusiastic teacher (MCA qualified, Java trained) in one of the Chennai schools said that the teachers *need separate facilities for high and higher secondary levels to go beyond the syllabus*.

<sup>37</sup> MHRD questionnaire has a detailed segment on effective use of technology.

Second, as the team showed interest in the CS curriculum, teachers in most schools reported that computer was taught as a theory subject; access to internet and ICT tools were restricted to students. To quote an ICT teacher (Dharmapuri school), *“Our XI & XII students do not have sufficient number of practical sessions”*.

Third, Lack of recognition, low pay, adhoc appointments (to the post of computer instructor) and work pressure (academic and administration) were the reasons cited for de-motivation among computer instructors to opt for smart curriculum. There were no computer instructors in many schools across districts .

While the students of class XI & XII had exam-oriented coaching with relatively less practical training, there was no system or period allotment for students of class IX & X to conduct AV sessions in a systematic manner. However schools are familiar with visual medium of instruction. Language lab sessions and AV classes were identified as effective means of retaining the concentration of the students and teaching complex topics.

### **Technical Sessions in Remote Schools: Few interesting Findings**

Computer based assignments on critical issues such as rain water harvesting were given to students in many districts particularly Chennai, Villupuram and Dindigul. Some teachers (eg. In Dindigul) encourage the students to make use of promotional scholarship / freeship offers at private computer coaching centers.

ICT teachers usually bear the burden of administration work in schools. This was the situation not only in districts like Chennai, Villupuram and Dindigul where technology based curriculum was popular, but also in districts like Virudhunagar and Dharmapuri. To quote an ICT staff (Virudhunagar school) *“I am entrusted with administration work in this school. Considering the*

*volume of the assignment, BT teachers help me in the process. When I get held up in office work, my classes are taken over by other teachers”.*

However, e-registers of students’ attendance or marks scored were not used to monitor and evaluate students’ academic performance or to attempt suitable revisions in the curriculum or teaching modules. Further, digital endeavours using e-data like creation/use of school blog, school website, virtual library, sharing of e-content among local schools had not yet begun in any school. There seemed visible underutilization of the potential of teachers; even highly qualified teachers (M. Phil., Ph.D.) who had been using computer for their academic venture restricted themselves to data entry and to some extent subject related browsing, downloading.

### **Towards ICT-enabled Education: Voices of teachers**

- e-administration of the ICT teacher: *“Computer teacher takes full care of office work that includes nominal roll entries, 10 & +2 (SC, ST) scholarship details, employment registration, power finance, e-mail interactions. So, we are not able to focus on +1 & + 2 and other class students who approach us for help in computer applications. It is good to hire clerks and assistants to undertake such work” – Coimbatore school.*
- ICT arrangements for non-CS group (Higher Secondary and Secondary students): *“Yes, ICT is a modern teaching-learning method that promotes effective learning and creative thinking...*

*but then ICT use is not timetabled in the school... We need systems for IX& X students – Dindigul school.*

- *Practical difficulties: The HM of a remote school regretted that being an inaccessible region (hilly region), they face inordinate delays in getting government support.. R& M was the most difficult factor; in the absence of contract renewals, arrangements were made with local engineering college for technical support, again of temporary nature – Coimbatore.*

In spite of many difficulties in adopting the ICT, findings from the field that indicate point to the scope of technology based education

- Well qualified computer instructors and subject teachers who were keen in training their students in computer technology.
- Teachers in many districts were proficient in all the 11 crucial ICT applications – “e-books, surfing, spreadsheet, word software, presentations, photoshop, drawing, programming languages, games, social networking, downloading and subject specific handhelds”. The teachers’ listed google search, visiting websites (Kalvisolai) for educational news, downloading subject-specific information and model questions papers as their technology based assignments
- Computerisation of school work has enhanced the preparedness and comfort levels of the teachers.

### **Positive Influence of HM/Teacher In-charge of ICT Implementation**

In 4 of the schools that were surveyed:

- GHSS, Mazhaiyur, Tiruvannamalai district
- GKHSS, Kondamanaickanpatti, Dindigul district
- GHSS, Velachery, Chennai district
- GHSS, Choolaimedu, Chennai district

we found that better awareness of and interest in ICT on the part of the HM/Teacher in-charge of ICT implementation have a definite positive impact on the overall ICT environment in that particular school.

In view of the finding that most of the HMs across all schools surveyed are themselves not optimally equipped nor fully motivated to make use of ICT, we suggest intensifying the

training given to HMs and taking steps to increase their interest and motivational levels for ICT.

**Concerns of the teachers regarding use of ICT in school curriculum (all districts):**

- Specific school budget for ICT needs to be clearly allocated. PTA funds, HMs/computer teachers personal resources are only temporary support.
- Mostly syllabus based teaching and lack of time for creative applications.
- Use of home computers and personal data cards for schoolwork as net access was limited in schools.
- Facilities for, and staff training in, the design and preparation of e-content was needed as SSA/RMSA sponsored CDs have been put to repetitive use.
- Poor technical support of ELCOT.
- Technology based curriculum could be cumbersome to some students. Hence, it may be difficult to use in class room teaching unless sufficient tools are available to foster the competency and comfort levels of students through practical sessions.

Computer instructors and subject teachers play a vital role in developing a full-fledged ICT enabled curriculum. Thus it was felt that the concerns of the teachers be addressed on priority.

**5.6 ICT Educators as Content Developers**

***I use ICT for visual presentation on selected topics e.g. to show world map to visually describe geographical conditions like earthquakes for instance” (Thiruvannamalai school teacher).***

Under ICT, self-learning initiatives of the students are encouraged by the teacher through innovations in curriculum. Our field discussion with the teachers and the students indicated that technology based assignments, were used in school as a tool of creative learning. But such applications have just begun.

School surveys showed that for becoming a good ICT educator, a teacher’s motivation and interest in ICT enabled education and the support on site are as crucial as academic qualifications and training.

Interviews with the teachers provided an insight into this.

The academic qualification of the teacher was seen as necessary to be able to initiate the ICT education in schools. This was the case in all schools; even many non-ICT teachers were MCA and BE graduates in (Chennai schools) and MCA, PGDCA and DCS certified teachers (Villupuram schools). Also, there were DIT holders (Diploma in Information Technology) and NIIT trained non-ICT teachers in some schools (Dindigul and Dharmapuri schools).

On the issue of ICT-specific training, the teachers pointed out that SSA computer training enabled them to get familiar with computer related terms and learn the hardware/software components of PCs. However, the ICT-trained teaching staff was less in schools across districts. The teachers (all districts) were not aware of “Pre-Service and In-Service”<sup>38</sup> package under ICT scheme.

It was observed from the field that the effective use of competency and skill sets of the teachers depended upon support onsite. It was found that in many schools across districts, that it was not only the ICT infra, but also the poor basic facilities (like drinking water, compound wall, tables and chairs in class rooms, reliable electricity) that constrained the use of ICT.

Teachers argued that small class rooms and congested seating arrangements in labs made AV sessions difficult. While power breakdowns were cited as a major issue in schools across districts (Chennai, Dharmapuri, Virudhunagar), the teachers pointed out that presently none of the schools had a generator, and inverters were working in very few schools. Frequency of fault occurrence in landline phones was cited in many schools.

During FGDs computer instructors had a detailed report (all districts) on the digital requirements when asked about the challenges they encountered in ICT curriculum. It was pointed out that it was not possible to conduct ICT classes when satellite and ROT were not available, (no district had these facilities in schools, systems and projectors were not in working condition, printer (old model) and scanner facilities were poor. *One of the teacher’s during group discussion frankly stated that though they understood the merits of the new method, it was futile to discuss its impact and benefits when basic facilities were not available* (Dindigul school).

An important finding from the FGDs was that personal interest and the skill set of the non-ICT teachers led to better ICT application in schools. Use of computer in teaching languages – English and Tamil, science exhibitions and models, visual medium of presentation for complex topics and social issues in some schools – proved that interest of the teachers fosters ICT enabled education. As already mentioned, though the teachers have not undergone Government sponsored ICT training, some have attended private training programmes for skill enhancement out of their own interest or representing the school.

---

<sup>38</sup>[www.teindia.nic.in](http://www.teindia.nic.in): Revised ICT@ Schools Scheme, Department of School Education and Literacy, MHRD, Government of India. Last accessed: 1.10.2013.

Several teachers, especially better qualified ones, expressed dissatisfaction. This might require immediate attention.

#### **A Note on Computer Usage of Non-ICT Teachers under different Parameters across Districts**

---

- a. Among various ICT applications, teachers making power point presentations in non-ICT subjects were found in very few schools.
  - b. A few of the potential teachers were guiding students in computer applications.
  - c. Using computer for preparing lessons and collecting information was found in many schools.
  - d. Visiting educational sites and google searches were done frequently by teachers.
  - e. While e-communication among colleagues and for personal reasons was reported, the teachers have not started mail interaction formally with parents or on school related endeavours.
  - f. Few teachers noted that they have mail interaction with district and state offices regarding e-schooling initiatives (office work).
  - g. In urban schools, social networking interest was found to be relatively higher than in remote schools. Likewise, the use of computer for e-communication was found to be less among the non-ICT teachers. Many of them said they took the help of family/friends/co-staff to check or send mails.
  - h. Data entry of marks, attendance and e-entries of students particulars were done by ICT and non-ICT teachers; but in none of the schools the task of tracking of students performance has begun in a serious way.
- 

In many schools, the HMs indicated the slow progress of the ICT. Among the four major school functions supported by ICT – administration, database, library and projects, the HMs noted that *as of now teachers were presently involved in administration and database work and not gone into library and project assignments.*

It may be noted that as a part of ICT enabled curriculum, four types of projects were suggested<sup>39</sup> (a) projects for group work among students; (b) projects for integrating ICT in school curriculum; (c) projects to induce self-learning practice among students; (d) projects that require collaboration of staff and students. Considering this broad agenda of ICT curriculum, it seemed vital to recollect the statement of the HM in one of the schools *that teachers' do not come forward to use computer/internet stating that they are held up in their academic routine at school* (Dharmapuri).

---

<sup>39</sup> Drawn from MHRD questionnaire.



When the team tried to get the teacher's views on ICT capability, a majority showed dissatisfaction with the existing skill sets (Table 9). They immediately expressed their interest in getting trained as they considered themselves to be *'fast grasping'* (Table 9). They also explained the nature of training they would like to have, in terms of subject-specific and skill-specific training. There was a strong preference for 'chalk and talk' among some teachers who felt that it was more interactive; they also felt that it created a bond between the teacher and the student which may not be there in a technology based curriculum. However, teachers had no objection to using the two methods in an integrated manner. The need for comprehensive induction training was highlighted so as to raise the competency, preparedness and comfort level of teachers.

During FGDs, the non-ICT teachers in many schools admitted that they have *"not explored"* the effectiveness of technology in teaching subjects particularly in Hindi, Local language, Social Sciences and Accountancy (Table 16). Teachers argued that *it is not only time constraint, but the heterogeneity in students' aptitude that deter them to opt for ICT curriculum; nonetheless, they do not mind a blend of chalk and talk and ICT methods. To quote the assertion of a teacher, "Chalk and talk method in teaching is a must for Indian students there should be scope for ICT sessions as and when required.* (Coimbatore school). Though majority of the non-ICT teachers agreed *that technology promoted practical learning and created visual impact, there were a few who believed that it was cumbersome.*

The teachers in general held an opinion that technology cannot replace chalk and talk. However it was encouraging to mark the perception of the teachers that use of ICT in education could be very effective.

### **5.7 ICT in School Education: Interaction with Students**

---

*"A student from a remote school stated with pride that he requires internet for collecting information in Maths and Science subjects (informative purpose) and uses computer for English and Computer Science homework (functional purpose); HTML programming is his favorite activity (creative purpose) and has e-mail contacts with teachers and friends (communication purpose)" – Dindigul school, extract from notes on FGD with students.*

---

Interaction with the students was the most engaging part of our field survey as they are the basic reason for such schemes to exist.

Interactive sessions with students happened class-wise with students from classes IX, X, XI and XII. During the interviews, the enthusiasm of the students towards technology based education was evident. Striking observations/responses/reactions/from the students are discussed below while assessing their skill set and preparedness for ICT enabled education.

At the outset, the team was interested in clarifying three aspects from the students:

- Where do the students access computers?
- What are their favourite activities using computers?
- How often they use computers for intended activities?

On discussing about the availability of systems in school, the students' chorus response (in all schools) was, "*We have no access to computer in school; only +1 & +2 students use it for subject-related purposes*". The school computers and internet were not available for students for any academic assignment. They said that computers in schools were meant for office work mainly and was used by CS group students during lab sessions. The ICT teachers intervened and stated that *the available systems were insufficient to meet the needs of the CS group too and so they had more number of theory classes than practicals*.

It was evident that a high percentage of students were dependent on school computer alone and thus were looking forward to easy access in school. Their eagerness was visible when the students in most schools remarked that *they were not given opportunity so far; if given, they are interested to learn ICT applications*. Some students were attending private computer classes guided by the teachers to make use of scholarship facilities offered in most of the certification courses. Many students pointed out that in the absence of fee concessions private *computer coaching was expensive and not possible for them*. In fact, *the economic condition of the students*, becomes a critical reason for insufficient progress on ICT in schools, because students cannot afford to access computers / internet outside.

While the team found computer based assignments to be popular in districts like Chennai and Villupuram, only a limited number were fully involved in such projects. The percentage of students who visited internet centers was low. Even in this group, we find students visiting centres run by their friends/people known to them who are flexible about payment. Further, the students' put forth that there was *for opposition to visiting these centers from their families economic reasons*.

Thus, it could be learnt that there were a sizeable percentage of students (25%) who had no computer access (school and private).

From among those who had access, the enthusiasm was more for entertainment than for academic purposes. As the team discussed with the students about their favorites activities using computer, *playing games and viewing videos/ images were cited as very interesting, while use for school related work and chatting were second.* Few significant ICT practices by students across districts that captured our attention:

- Using mobile phone for downloading pictures, subject related models, songs. Such self learning practices were amazing.
- Using internet as a source of rich data; by using the data innovatively in scholastic (science exhibitions, model question papers) and non-scholastic activities (organizing theme based cultural events/competitions in school functions), creating awareness on ICT in school.
- Interestingly, though very less in number, there were beginners in e-communication - face book, twitter, Skype and students with personal email ids.
- Web search for exam results, trying on-line registration and attending on-line study courses were exciting attempts for students with potential.

While innovative applications had begun in schools in both scholastic and non-scholastic assignments, ICT tools were not used on a regular basis. The non-users of ICT were found to be more than the users. In the three important purposes – informational, functional and creative, the “*not at all’s*” were more than “*often*” users.

While assessing teachers’ estimation of the students skill set and comfort levels and students self appraisal, it was the teachers who found the students to be “fast grasping” in terms of their skills, competency and comfort levels and “average” in their preparedness for the new curriculum. Studying their ICT potential, the grades of the students for themselves stood in the order (from highest to the lowest) “bad, average, good and excellent”. It was consoling that there was a sizeable number of students who felt they were good in technology (114/640 students. Among the districts, Chennai had the largest number of excellent students and Coimbatore had the largest

number of good students. Good users were those who had access to computer on a regular basis (private) and were able to develop their competency. Bad users were those students who had no opportunity, though many of these students showed enthusiasm in technology based education.

From our FGD with students and teachers, it was clear that if ICT is integrated into the curriculum with adequate support for the school (in terms of infrastructure, training and materials for students and teachers), smart learning system would see immense participation from the students.

## **CHAPTER 6**

## **CONCLUSION AND SUGGESTIONS**

### **Concluding observations**

Following the MHRD guidelines an evaluation of ICT@Schools Scheme was undertaken in Secondary/Higher Secondary Government and aided schools covering 8 districts in the state of Tamil Nadu. The field investigation at the school level primarily focused on the appraisal criteria drawn from the TOR supplemented by views from the field.

- The Enrollment pattern comprises an average of 63% in General category, 32% in SC category and 5% ST category. The proportion of SC/ST community children is high in government schools. Proper implementation of the ICT scheme will definitely bring an enormous change in the education pattern of children from the weaker/marginalized sections.
- In Tamil Nadu, there is no separate department called ICT department in schools. The computer Labs are considered as the ICT department. While Computer Labs are available in nearly 90% of

the schools surveyed, we find that there is scope for better utilization. Alongside 11<sup>th</sup> and 12<sup>th</sup> standard students who have taken Computer Science as an elective subject, the labs should be made more and more frequently accessible to middle, high and higher secondary school children. As of now, most of the utilization is limited to 11<sup>th</sup> and 12<sup>th</sup> standard students who have Computer Science as an elective subject.

- In Cuddalore and Chennai districts, the ICT intervention has started early in the years 1986 and 1997 respectively. In other districts, ICT intervention was during the period 2005-2007. In spite of this there is no significant gap between the schools in these districts in terms of the physical infrastructure available.
- Individual PCs, server with terminals, printers, broadband antenna and UPS are available in 100% schools. But not all are in working condition. (Please refer to table. 5 in Chapter 4). For example, while Projectors and Laptops are available in 98% and 93% schools respectively, projectors are in working condition in only about 60% of the schools. Other ICT facilities such as scanner, web camera, modem, video camera and – most importantly – power generator/solar power are available in very few schools. Ensuring alternate sources of electricity in areas where supply is low / very erratic will go a long way in better utilization of existing infrastructure.
- ICT is taught as a subject at the Higher Secondary Level in 100% schools but only for those students who have opted for computer science as their elective subject. This must be expanded by introducing basic level courses, including individual exposure time, for all children from 8<sup>th</sup> standard onwards.

In most of the schools, students have not had the opportunity to use computers at the high school level from 8<sup>th</sup> to 10<sup>th</sup> standard. At Primary level, they do have CAL centers active in some of the schools, which provide access to computers. It is the middle and high school children who have no opportunity to use computers unless they are able to get Computer Science as one of their electives in 11<sup>th</sup> standard. This needs to be and can be changed.

- Thanks to the trainings organized by SSA, Secondary Grade Non-ICT teachers have had some minimum computer training on the basics, MS office and internet usage. However, there were no practical sessions during the training. So most non-ICT teachers whose academic schedule is anyway packed with teaching their subjects, have had very little hands-on experience with

computers. More exposure time and hands-on training are needed to familiarize them with an ICT-enabled teaching-learning environment so as to improve their utilization of available ICT facilities to teach non-ICT subjects.

It must be noted that this SSA basic training was limited to Secondary Grade teachers. None of the Primary Grade teachers have had any training in computers.

- In several Schools, the Administrative Staff post is vacant; the teachers who possess some basic computer knowledge, especially the ICT teachers, were engaged in doing the School Administration work part-time after their school hours. The vacancy in non-teaching staff position needs to be addressed on an urgent basis.
- There are no ICT teachers appointed in any of the Government or Corporation Schools in Tamil Nadu. We have considered the computer teachers appointed to teach elective subject Computer Science for 11<sup>th</sup> and 12<sup>th</sup> Standards as ICT teacher.

It must be noted however, that Government Adi-Dravida Welfare Schools do not have any provision to appoint a computer teacher.

- Only about 20% of teachers are using technology in their day-to-day activities. (Please refer graph. 3). 27% of them read e-books, 47% surf the internet, 15-18% use excel spreadsheet, 11% use it for social networking and 33% download subject related articles from the internet. However, they all use computer and internet only at home and not in school.
- Majority of the Non-ICT teachers agreed that technology promotes practical learning, it creates visual auditory impact, it encourages interactive learning and that it saves time as well. 47% felt that technology is partially difficult to use due to heterogeneity of the students' aptitude. While a clear majority (69%) felt that technology couldn't replace the traditional Chalk & Talk Method, most of them (79%) were also clear that technology could be successfully integrated into the Indian teaching-learning environment.
- School HMs who are knowledgeable and motivated about ICT have a positive impact on the overall ICT environment in schools. Intensifying the training given to HMs and taking steps to raise their motivation and interest levels would surely help improve the overall effectiveness of the ICT initiatives.

- The major factors that affect ICT implementation could be listed as
  - Non-Availability of ICT material to teach subjects
  - Lack of Awareness amongst the HMs and teachers regarding usage of ICT in teaching subject
  - Lack of basic knowledge and training among a majority of PG teachers
  - Underutilization of existing ICT tools
  - Non allocation of recurring or maintenance expenditure in the School Budget
  - Ensuring enough exposure to children from socio-economically weaker background
  
- The single most important request that emerged from almost all the School HMs and Teachers was to set up of common service centers, which are easily accessible for repairs and maintenance of the ICT infrastructure.

\*\*\*\*\*