2. India Case Studies: Karnataka

Established as a state in 1973, Karnataka with Bengaluru as its capital has emerged as the leader in the sectors of IT and biotechnology in the country since the 1980s and became the first state in India to announce an IT Policy in the year 1997. It is the eighth largest Indian state by area with a population of 52,850,562. Kannada is the official and most widely spoken language. The State has an estimated GSDP (Gross State Domestic Product) of about INR 2.68 trillion (approximately USD 59 billion) at current prices, in the year 2008-09, and is regarded as one of the more economically progressive states in India. More than half of the population in Karnataka is dependent on agriculture. Karnataka is also the manufacturing hub for some of the largest Public Sector Companies like Hindustan Aeronautics Limited, National Aerospace Laboratories, Bharat Heavy Electricals Limited, and so on.

The state of Karnataka is divided into 30 districts, which are further divided into subdivisions, and the subdivisions are divided into blocks.

In 1980s, Karnataka emerged as the worldwide hub in the field of Information Technology and Information Technology-enabled Services. In 2007, there were more than 2,000 IT companies operating out of Karnataka, including IT giants like Infosys and Wipro.

Some of the demographic indicators of Karnataka are as follows:

**Table 5: Demographic Indicators - Karnataka**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Statistics (2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>Bengaluru</td>
</tr>
<tr>
<td>Population</td>
<td>52,850,562 (2001 census)</td>
</tr>
<tr>
<td>Population density</td>
<td>275.6/sq. km</td>
</tr>
<tr>
<td>Area</td>
<td>191,791 sq. km</td>
</tr>
</tbody>
</table>

Source: India 2009, A Reference Annual

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3 http://india.gov.in/knowindia/st_karnataka.php
4 des.kar.nic.in/ecsurveynew/chapter1_eng.pdf
2.1. Background

Brief Overview of the Education Scenario

There are three kinds of schools in the state, viz., government-run, private aided (financial aid is provided by the government), and private unaided (no financial aid is provided). The primary languages of instruction in most schools are Kannada and English. As of March 2006, Karnataka had 54,529 primary schools with 8.495 million students and 9,498 secondary schools with 92,287 teachers and 1.384 million students.\(^5\) The syllabus taught in the schools is either of the CBSE, the ICSE, or the state syllabus (SSLC) defined by the Department of Public Instruction (DPI) of the Government of Karnataka. To maximize attendance in schools, the Karnataka Government has launched a mid-day meal scheme in government and aided schools in which free lunch is provided to the students.

The state is also home to some of the premier educational and research institutions of India such as the Indian Institute of Science, the Indian Institute of Management, the National Institute of Technology Karnataka, and the National Law School of India University. Many of India’s premier science and technology research centers, such as Indian Space Research Organization, Central Power Research Institute, Bharat Electronics Limited, and the Central Food Technological Research Institute, are also headquartered in Karnataka.

Some of the key education indicators in the state are given as follows:

<table>
<thead>
<tr>
<th>Table 6: Education Indicators - Karnataka</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education Indicators (2007–08)</strong></td>
</tr>
<tr>
<td><strong>Gross enrollment ratio (%)</strong></td>
</tr>
<tr>
<td>Primary school</td>
</tr>
<tr>
<td>Upper primary school</td>
</tr>
<tr>
<td>Secondary school</td>
</tr>
<tr>
<td>Higher secondary school</td>
</tr>
<tr>
<td><strong>Dropout rates (%)</strong></td>
</tr>
<tr>
<td>Class I–V</td>
</tr>
<tr>
<td>Class I–VIII</td>
</tr>
<tr>
<td>Class I–X</td>
</tr>
<tr>
<td><strong>Teaching staff</strong></td>
</tr>
<tr>
<td>Pupil/teacher ratio</td>
</tr>
<tr>
<td>Primary school</td>
</tr>
<tr>
<td>Upper primary school</td>
</tr>
<tr>
<td>Secondary school</td>
</tr>
<tr>
<td>Higher secondary school</td>
</tr>
</tbody>
</table>

\(^5\) [http://www.karunadu.gov.in/education/Pages/schools.aspx](http://www.karunadu.gov.in/education/Pages/schools.aspx)
Administration of School Education

The Department of Public Instructions (DPI) controls and coordinates the activities of school education in Karnataka at all stages of school education, starting from pre-primary to secondary education in the State. The Department has a secretariat and field departments with a three-tier structure at state, district, and block levels.

The Department of State Educational Research and Training (DSERT), the academic wing of the DPI, works to improve the quality of education provided in primary and secondary schools. Various ICT-based projects in schools that are presently being undertaken in the state are carried out by DSERT’s Education Technology Cell. Preparation of teacher training modules and catering to the needs of various categories of teachers is also undertaken by DSERT. The Education Technology cell is also experimenting with various approaches in teacher training through activity-based methods, teleconferencing, direct to classroom broadcasts, multi-grade teaching techniques, and so on.

The objectives of the department are as follows:

- To provide academic leadership in school education in the state
- To achieve qualitative improvement in school education through teacher training
- To promote Action Research in order to facilitate teacher development
- To undertake academic reforms in the light of policy changes by the state
- To coordinate at the state level, schemes of various state, central, and international agencies like NCERT, NIEPA, UNICEF, SSA, RIE, IISC
- To undertake various projects in the field of education in collaboration with various agencies working in the field of education including NGOs
- To administer teacher education in the state
- To act as a nodal agency in providing in-service training of both primary and secondary teachers
- To prepare teachers’ hand books, resource books, and other materials for use of students and teachers

Brief Overview of the ICT Scenario

Administration of ICT

The Department of Information Technology, Biotechnology and Science & Technology has the responsibility of promoting the growth of Information Technology, Biotechnology and Science in the State. In the last few years, Bengaluru has become one of the major Information Technology hub with more than 1,000 IT companies operating out of Bengaluru. Some ICT parameters are shown in the following table:

<table>
<thead>
<tr>
<th>Literacy level (%)</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban literacy level (India)</td>
<td>80.58 (82)</td>
<td>86.66 (88)</td>
<td>74.12 (75)</td>
</tr>
<tr>
<td>Rural literacy level (India)</td>
<td>59.33 (61)</td>
<td>70.45 (72)</td>
<td>48.01 (50)</td>
</tr>
</tbody>
</table>

Source: Select Educational Statistics, 2006-07, Government of India
Table 7: ICT Parameters - Karnataka

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Data</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless subscription base</td>
<td>28,867,734</td>
<td>Sep 2009</td>
</tr>
<tr>
<td>Wireline subscription base</td>
<td>2,751,296</td>
<td>Sep 2009</td>
</tr>
<tr>
<td>Total number of Internet users</td>
<td>1,063,819</td>
<td>Sep 2009</td>
</tr>
<tr>
<td>Total number of broadband users</td>
<td>768,245</td>
<td>Sep 2009</td>
</tr>
</tbody>
</table>

Source: The Indian Telecom Services Performance Indicators, July–September 2009: Telecom Regulatory Authority of India

Usage of ICT

As per a recent survey conducted by PricewaterhouseCoopers optimal use of ICT in the elementary education service delivery is yet to be achieved:

**Computers**

Computers are used more by the administration than in academics as teaching tools. Computers are found in most of the offices up to the block level. At block offices, there are about 1 to 2 computers but with limited access and restricted usage. Usage is also limited to word processing, like typing out letters; even spreadsheets are used as a word processing tool with no utility on data analysis.

**Satellite Programme—EDUSAT**

The DSERT is responsible for the EDUSAT (Education Satellite) programme wherein television-based video lessons are broadcast direct to classroom in a total of 1,770 primary schools in Chamarajanagar district and Gulbarga district. It was observed during the field visit that the departments’ radio programme has a wide impact and is effective, especially on the rural schools.

**Electronic and Mobile Communication**

One of the least exploited ICT facilities is the e-mail and mobile telephony. The present e-mailing features are limited to few of the officers up to the block level and mostly limited to the meeting notice and information transaction. Further, these communications are mostly followed and duplicated through manual communication. Given the wide coverage on field by the cluster-level officials especially for data collection and collation, usage of mobile technology would have facilitated easy connect and information exchange, which is lacking in a big way.

**Education Management Information System**

With state-level e-Governance initiatives in place, the DPI has also developed and put in place a large-scale operational Education Management Information System. However, given the concerns with reference to data quality and usage by the various levels and for various developmental aspects, the initiative has not grown beyond its preliminary status.
Further, the department does not adopt any standard principles or framework of monitoring and evaluation to channelize the data capture and reporting for intelligent business analysis at various levels of the organization. The present system only operates on the information consolidation principles, where all the micro/minute details are commonly shared across various levels in the organization.

**Web sites**

The State department of Primary and Secondary education operates two informative Web sites: one being (http://kar.nic.in/schools/) acting as a comprehensive school-level databank and the other (http://www.schooleducation.kar.nic.in/), providing the overview of the department, its functions, and various activities undertaken by the department including the data pertaining to schools. However, it is felt that the information presented in these Web sites is limited and does not facilitate any dynamic usage.

Further, the DSERT operates a Web site (http://dsert.kar.nic.in/), which details the overview of the departments’ roles, functioning, and initiatives, and provides access to textbooks of Class X, for Kannada and English medium of instruction for all the subjects. Even though DSERT aims to gradually cover all classes and all mediums, at this juncture there is very limited focus on the elementary education service delivery.

### 2.2. Policy Framework and Delivery Mechanism

This section describes various policies and plans adopted by the State of Karnataka to bring in an ICT-based educational change in the state.

**IT Policy**

Karnataka State Education Act 1983 (amended in 1998) does not mention the use of ICTs for primary and secondary education, neither has the state of Karnataka released any policy for ICTs and primary and secondary education specifically. However, the state announced its IT policy in the year 1997 known as “Mahiti, The Millenium Information Technology Policy of Karnataka.” In the area of education, the policy plans to take ICT to all the schools and to set up training centers in schools. These centers are to be supported by the private sector to impart teacher training, computer education as well as foster general education with the help of ICT tools. The policy further stipulated that private companies running such centers can employ them for commercial use before and after school hours.

Thus, computer-based education was introduced in Karnataka, starting with 1,000 government Secondary Schools under the Mahiti Sindhu Project in the year 2000 by the Government of Karnataka. The Project was exclusively funded by the State, and later on various other central- and state-funded schemes for ICT in education was introduced in a number of government schools and private grant-in-aid schools. A list of the number of schools covered under various schemes to introduce ICT in education is as follows:
Table 8: Number of Schools under ICT in Education Schemes - Karnataka

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Schemes/Programs for ICT in education</th>
<th>No. of schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mahiti Sindhu (State-funded project)</td>
<td>1,009</td>
</tr>
<tr>
<td>2.</td>
<td>Revised CLASS Project (Centrally assisted scheme)</td>
<td>150</td>
</tr>
<tr>
<td>3.</td>
<td>11th Finance Commission Scheme (Centrally assisted scheme)</td>
<td>88</td>
</tr>
<tr>
<td>4.</td>
<td>ICT@Schools, Phase-I (Centrally assisted scheme)</td>
<td>480</td>
</tr>
<tr>
<td>5.</td>
<td>ICT@Schools, Phase-II (Centrally assisted scheme)</td>
<td>1,571</td>
</tr>
<tr>
<td>6.</td>
<td>ICT@Schools, Phase-III (Centrally assisted scheme)</td>
<td>516</td>
</tr>
</tbody>
</table>

Total no. of government schools in the State of Karnataka 3,814

Source: Department of Education, Government of Karnataka

Computer Education Plan (CEP)

As per the Central Government Policy, each State shall develop a computer education plan, which shall identify the specific roles to be played by the State and Central Government. Thus under CEP, the State requires to cover the remaining secondary schools (yet to be covered) under ICT Phase-III along with the government schools under the Mahiti Sindhu Project, Revised CLASS Project, and the 11th Finance Commission Scheme. In addition to the 3,814 government schools, it is also planned to outreach the ICT Program to 2,633 private grant-in-aid schools in Karnataka. While extending this program to private grant-in-aid schools, it is proposed that 50% of the share will be met by the State Government as grant and the remaining 50% shall be met by the management of the respective schools.

2.3. Initiatives

Despite of not having a cohesive set of policies for ICT in education, Karnataka is one of the leading states in the country in this field. The Department of Education has shown immense interest and commitment toward promoting the use of ICTs for primary and secondary education. Thus, due to the initiatives of the state, public private partnerships (PPPs), and NGO activities, various programs have been implemented in the state. Karnataka is one of the leading states in the country in PPPs in this field and numerous benefits have emerged from this type of partnership.

The following section provides an overview of the ICT in education initiatives of the State. The initiatives have been described under four broad sections namely formal education, teacher training programmes, non formal education and radio programmes.

Formal Education:

The Education department has initiated ICT programmes for government schools; a majority of which are located in the rural areas. Through these programmes, the Department is addressing computer-aided education in primary schools and computer education and CAL in high schools.
2.3.1 Mahiti Sindhu programme

The programme plans to provide free computer education to students and teachers (grades VIII, IX, and X) in 1,000 schools of Karnataka. A special emphasis was given to girls and backward class students of rural areas while selecting the schools to be covered under this project. The programme is a fully State-funded project. The Project was implemented by the Education Technology cell of the DSERT; monitoring and supervision was done through the district DIETs, which acted as nodal agencies; and evaluation was conducted by the Indian Institute of Science and computer science departments of other engineering colleges of the state. The project has already been completed in 50 high schools of Karnataka in 5 years and has been extended up to 88 more schools in Karnataka for 3 years under the 11th Finance Commission.

The key deliverables of the project are as follows:

- Provide computer education to the students of selected government schools in the State of Karnataka.
- Help the subject teachers in teaching the hard spots with the help of content CD ROM’s available in the lab.
- Train the subject teachers on the basics of computers and its applications in teaching.

The Department collaborated with many private IT companies to implement the project. Software for subjects like Social Science and Mathematics were prepared by School Net India Ltd. and software for subjects like English and Science were developed by Edurite Technology Ltd. Three Institutions, NIIT, Aptech, and Educomp Solutions, were given the responsibilities for project execution on a turnkey basis for a period of 5 years. Their responsibilities for the project are highlighted in the following box.

### Allotment of Schools to Computer Agencies

<table>
<thead>
<tr>
<th>1. Responsibilities of Computer Agencies under Turnkey Educational Projects:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Infrastructure: This involves setting up computer lab inside the premises with the required computer hardware, software, and accessories and providing the necessary furniture and fixtures, including the maintenance of the computer hardware and accessories.</td>
</tr>
<tr>
<td>2. Appoint two full-time qualified teachers (trained instructors) in each school to handle the curriculum and maintain the center for a specified period of time.</td>
</tr>
<tr>
<td>3. Train the government school teachers in computer literacy and computer-based learning.</td>
</tr>
<tr>
<td>4. Bearing recurring expenses such as monthly electricity charges, computer faculty salary, and consumables such as printer paper, floppies.</td>
</tr>
<tr>
<td>5. Imparting IT education from Classes 8–10 as per the syllabus prescribed by Karnataka Government</td>
</tr>
<tr>
<td>6. Students should be taught either in Kannada or English medium as opted by them</td>
</tr>
<tr>
<td>7. Provision of bilingual courseware and multimedia instructional material (CBT) in English and Kannada</td>
</tr>
</tbody>
</table>
Responsibilities of NIIT
- Setting up computer facilities with hardware, software, UPS, and other accessories at 700 secondary schools in 15 districts of Karnataka.
- Provision of telephone and Internet connection at each school.
- Development of course materials and multimedia-based instructional materials in English and Kannada.
- To train 150,000 students every year.

Responsibilities of Aptech
- Setting up computer facilities with hardware, software, UPS, and other accessories at 250 secondary schools in Karnataka.

Responsibilities of Educomp
- Setting up computer facilities with hardware, software, UPS, and other accessories at 50 secondary schools in Karnataka.

The Mahithi Sindu Project has been extended for another three years. Keonics annual maintenance has taken up the responsibility of delivering computer education and training of teachers in the implementation of extended Mahithi Sindu Project. Various impact studies for the project have been conducted, details of these studies can be found in Annexure I

2.3.2. Eleventh Finance Commission Project

The project implemented in 2003–04, spread over a period of 3 year, aimed at providing computer education in selected 88 government secondary schools in the state. The total estimated cost of this project was INR 0.11 billion (approximately USD 2 million). Educomp Datamatics was selected through open tender process for the implementation of the project. Project, computer hardware, software, UPS, generator, and peripherals were taken on an outright purchase basis.

2.3.3. Revised CLASS (Computer Literacy and Studies in Schools) Project

The Computer Literacy and Studies in Schools (CLASS) Project was first introduced in 1984–85 throughout the country in collaboration with MHRD and Electronics departments on a pilot, basis but the project came to a halt in 1997–98. The deficiencies in the CLASS project were sought to be rectified in the Revised CLASS Project, which was framed by MHRD in 2001. Under this project, only those schools which taught computer education as an optional subject were entitled for aid and the state governments had to bear 25% of the total cost of the project. The details of the project are provided in the following box.

Project details: Revised CLASS
- Based on the proposals submitted by the state, GOI approved the implementation of the Revised Class Project in selected 150 government secondary schools in Karnataka. Each school got a server and nine work stations. Computer education was to be given to a
maximum of 350 students in each school. Approximately 53,000 students in 150 government secondary schools are benefited under this project.

- The estimated cost of the project was INR 0.17 billion (approximately USD 3 million) for 3 years.
- An amount of INR 55,000 (approximately USD 1,000) was allocated to each school for site preparation. This amount was spent through the respective SDMCs.
- The identified agency to implement the project was Electronic Corporation of India Ltd. (ECIL). The agency had to provide hardware and software to the schools and also provide computer teachers for the implementation of the program.

2.3.4. ICT @ Schools Project

The ICT @ Schools Project is a centrally assisted scheme, which is to be implemented across the state through three phases.

**ICT@ Schools Project Phase-I**

The Government of India in 2005–06 has approved ICT@ schools scheme in 480 schools in Karnataka state and the first phase has been implemented in 2006–07.

Two institutions Educomp Solutions and Everonn were given the responsibilities for project execution for a period of 5 years.

**Project Details**

Each School has been provided with a server and 09 workstations. Approximately 168,000 students of 480 schools are benefitted under this project.

The key deliverables of the projects are as follows:

- **Educomp**: Setting up computer facilities with hardware, software, UPS, and other accessories at 264 secondary schools in Karnataka and teacher training
- **Everonn**: Setting up Computer facilities with Hardware, Software, UPS and other accessories at 216 Secondary Schools in Karnataka, and Teacher Training

*Source: Department of Education, Government of Karnataka*

**ICT@ Schools Project Phase-II**

ICT@ schools Phase-II scheme was implemented in 1,571 schools in Karnataka 2007–08. Only Educomp Solutions have been given the responsibility to execute the project for a period of 5 years.

**Project Details**

Each school has been provided with a server and 10 workstations. Approximately 314,280 students of 1,571 schools are benefitted under this project.

**Educomp Solutions** have signed an agreement with Department of State Education Research &
Training (DSERT), Government of Karnataka, for implementation of computer-aided education in 1,571 schools in Karnataka under the ICT @ Schools Phase II for a period of 5 years. The order is valued at INR 1,090 million.

The key deliverables of the projects are as follows:
- Supply of computer hardware, software, and connected accessories
- Teacher training

*Source: Department of Education, Government of Karnataka*

**ICT@ Schools Project Phase-III**

The third phase of the project is still under the planning stage, but it has been envisioned that the third phase shall encompass all the schools that have been covered under the Mahiti Sindhu Project, 11th Finance Commission, and Revised CLASS project along with all the 2,633 private grant-in-aid schools in Karnataka, with the objective of standardizing ICT in education for all the schools in the state. Also, the computers and other peripherals of the aforementioned projects are old and outdated and needs to be replaced.

Thus, the total number of schools under Phase-III shall be as follows:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Category of Schools</th>
<th>No. of schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Government schools yet to be covered under any ICT in</td>
<td>516</td>
</tr>
<tr>
<td></td>
<td>schools program</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Schools under the Mahiti Sindhu Project</td>
<td>1,009</td>
</tr>
<tr>
<td>3.</td>
<td>Schools under the Revised CLASS Project</td>
<td>150</td>
</tr>
<tr>
<td>4.</td>
<td>Schools under the 11th Finance Commission Scheme</td>
<td>88</td>
</tr>
<tr>
<td>5.</td>
<td>Private grant-in-aid schools in Karnataka</td>
<td>2,633</td>
</tr>
</tbody>
</table>

**Total schools to be covered under ICT @ Schools Phase-III**  4,396

*Source: Department of Education, Government of Karnataka*

### 2.3.5. Azim Premji Foundation – Computer Aided Learning

In 2001, the Azim Premji Foundation, a nonprofit organization, set up Computer-Assisted Learning Centers (CALCs) in 35 rural government primary schools to enhance the quality of learning of children through computer-based lessons developed for the Karnataka state curriculum for grades I to VII.

Today, in association with the Azim Premji Foundation, the Education Department is creating CALCs in government primary schools across the state. A total of approximately 600,000 students have benefited in 3,000 primary schools by the program, along with a total of 15,000 teachers trained. The Foundation develops a range of multilingual CDs to assist the primary school children in grasping their curricular subjects. For example, content based on animation and child-centered interactive games was created for use in the CALCs in the subjects of Mathematics, Environmental
Science, Geography, Kannada, Hindi, and English. The computers and operating expenses for the first year are provided by the government, whereas the physical site of the CALCs and the security and maintenance of the centers is provided by the community from the second year onward. Digital content for learning and managerial support for setting up and running the centers is provided by Azim Premji Foundation.

The foundation has mobilized community support and enabled the use of computers by community after school hours. Thus, many of the CALCs become kiosks after school hours enabling them to earn additional revenues to support the school and the program.

**Teacher Training Programs**

As a part of implementing ICT in schools, the State Government of Karnataka has taken up computer training of teachers in a big way. Besides computer literacy, the teachers are trained in using the Internet to enhance their teaching capabilities and skills. The summer vacations are used for computer training of teachers. Apart from the agencies (NIIT, Aptech, Educomp, ECIL, Everonn) who are involved with the aforementioned projects in implementing ICT in schools, Intel, Microsoft, World Links, and the American Indian Foundation are also associated with teacher training programs in Karnataka.

### 2.3.6. Intel

**Innovation in Education:** Intel has a worldwide nonprofit initiative called “Innovation in Education” and have tied up with the Education Department in Karnataka to impart training for teachers to innovatively use computer technology to enhance student learning. This teacher-training programme in CAL is currently being conducted in 1,000 schools under the “Mahiti Sindhu” programme. Under this program, Intel has trained and created a resource pool of teachers 1,500 master trainers.

### 2.3.7. Microsoft

Microsoft has tied up with the Education Department with an objective to:

- Accelerate IT literacy among government school teachers and students
- Promote ICT integration in schools

**Outcome:** Microsoft under an MoU with the State Government has set up three computer academies in Bengaluru, Dharwad, and Gulbarga for teacher training.

**Progress:**

- 1,864 master trainers trained
- 16,799 teachers trained by master trainers
- 32 teacher educators trained as master trainers
- 256 teacher educators trained by master trainers

### 2.3.8. World Links India

The World Links India Program was initiated in January 2002, with the training of 30 master
trainers from Delhi and Karnataka. As part of Stage I of the World Links India Program, World Links targeted 32 rural and underserved government schools in Delhi and Karnataka. The World Links Karnataka Program was launched in collaboration with DSERT and teachers have completed the Phase I training “Introduction to Internet for teaching and Learning.” As an outcome of the training program teachers in these schools have had an opportunity to work in computer labs and have also accessed the Internet to develop curriculum-based resources for their courses. In Karnataka, World Links is operating in 21 government and government-aided schools: 6 in Bengaluru urban, 8 in Gulbarga, and 7 in Bengaluru rural.

### 2.3.9. American Indian Foundation

Digital Equalizer Programme has been implemented in 216 government high schools in 18 districts in the state in collaboration with American India Foundation. The project encompasses the following:

a) Capacity building and collaborative activities by developing course modules and providing inputs for technical and academic developments, students, and teachers

b) Training programme for teachers and activity programme for students

c) Material development for teachers and students

d) Documentation of all activities

### Radio Programs to Support School Education

There are various interactive lessons and educational programs being broadcast through radio and televisions to support school education in Karnataka. For example, programs such as Chinnara Chukki (for Class I–II), Chukki Chinna (for Class III–V), and (Keli Kali for Class VI–VIII) are being broadcast on Akashvani (AIR—All India Radio) and various other programs on Science and Mathematics are being telecast everyday under the EDUSAT Programme at various government schools in the State.

### 2.3.10. DOT-EDU (T4) Project

In 2004, the SSA, the DSERT, and the Education Development Corporation (EDC), Washington, through a USAID initiative, collaborated to produce the dot-EDU project, which was launched in the state on August 16, 2005, with a pilot programme of Chukki Chinna (for students of Classes IV–V) in select districts. The program was then scaled up to the entire state as it became successful and achieved the requisite academic results. Thus, since 2005–06, Chukki Chinna (along with a separate series for Class III) and another series titled Chinnara Chukki (for Classes I and II) are being broadcast in all 32 districts of the state. The IRI (Interactive Radio Instructions) programmes are broadcast through 13 AIR stations in the state.

**Chukki Chinna** series of IRI programmes for grades 4 and 5 consist of 134 programmes. These programmes in Kannada cover content areas in English, Kannada, Maths, Science, and Social Science. Chukki Chinna series for grade 3 has 42 programmes for content areas in Kannada, Maths, and EVS.
**Chinnar Chukki** series of IRI programmes for grades 1 and 2 consist of 94 programmes of 30 minutes each in Mathematics, EVS, Kannada, and English. Based on “hard spots” identified by Karnataka teachers, trainers, and the State Government, both of these IRI series help teachers to more effectively teach difficult content in the five subject areas.

For the implementation of all T4 (The Technology for Tools for Teaching and Training) project activities in the state by the EDC, there is an MoU between the SSA, Karnataka, and EDC. As per the agreement, the SSA shares the costs related to teacher training and printing of teacher guides. EDC has also entered into an agreement with the DSERT to produce 20 IRI programmes for grade III in English language as the Government of Karnataka has decided to introduce English language as a subject from Class I onward in all the government schools.

Forty educational video films have been developed by EDC, which are being telecast through EDUSAT. It reaches around 1,888 schools across four districts in Karnataka. Similarly, unique Group Teaching and Learning computer software developed by EDC is being used in 2,500 primary schools with computers. A digital library has also been introduced in the state since 2007 and is used by district and sub-district structures. EDC also provides teacher training and apart from the regular IRI and GTL teacher training, teachers in Karnataka have also undergone training in a module developed by EDC called "My Inner Self." In phase I, EDC had trained 1,356 master trainers who in turn trained 89,900 teachers across the state. Details of students reached and teachers covered by the programme in the state are:

<table>
<thead>
<tr>
<th>Primary schools</th>
<th>Students (Grade 1–5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
</tr>
<tr>
<td></td>
<td>81,550</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of teachers/administrators trained</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150,450</td>
<td>32,718</td>
<td>183,168</td>
</tr>
</tbody>
</table>

Source: Department of State Educational Research and Training, DSERT, Government of Karnataka

*2.3.11. Keli Kali (Listen and Learn, started in 2000–01)*

Keli-Kali is a radio program on AIR and covers about 50,000 schools and 7 million children. The broadcast started from ten stations of AIR in 2000–01, aiming at Classes III–V of the schools in some of the backward north-eastern districts of the state. Teachers were provided the timetable and a handbook in advance, so that they could synchronize their teaching with the broadcasts, which were textbook based. The program was designed by the DSERT. Keli-Kali was then extended to all primary schools through all stations of AIR for Classes III–V, which broadcast programs throughout the year (Monday to Friday); the program was extended to Class VI in 2003–04. The subjects covered are Kannada, English, Urdu, EVS, and Mathematics. There is another afternoon program, which targets Classes VI–VIII and teachers and focuses on hard spots.
Internal assessments have shown that Keli-Kali is a much appreciated initiative since it provides additional resource material and help teachers use the radio as a supplement to classroom teaching. The music, sound effects, and theatre skills that are called for are also attractive. In all 185 episodes in different subjects and 45 episodes for Urdu-medium schools are broadcast.

2.3.12. EDUSAT: Satellite Project in Karnataka

EDUSAT, a dedicated educational satellite, was launched by the Government of India (in 2004) to serve the educational sectors offering an interactive satellite-based distance education system for the country. In Karnataka, it was proposed to utilize the technology to improve the quality of education at the elementary and secondary schools. In the first phase (launched in March 2005), all the primary schools of Chamarajanagar district were covered, and later on in the same year, it was expanded to the Gulbarga district. With both the districts combined, 1,770 (885 in each district) schools have been covered through EDUSAT.

At present, EDUSAT is also available in 427 schools in Bengaluru rural and 406 schools in Rmnagaram district. From an archive of 450 programmes on science and mathematics, two select episodes of half-an-hour duration each are telecast everyday under the EDUSAT programme. The UPLINK facility was established in DSERT, Bengaluru, and the downlink facilities at all the primary schools are provided with facilities such as ROTs and television sets to receive video lessons through EDUSAT, and with solar power facility to combat the frequent power problems. SSA supports the project in partnership with the Indian Space Research Organization (ISRO).

Source: Department of State Educational Research and Training, DSERT, Government of Karnataka

Non-Formal Education

The Karnataka Government has initiated various e-governance systems for enhancing rural development, for the purpose of education, the government started the YUVA scheme to provide basic education to the rural youth.

Non formal education is also being imparted through community radio, the concept behind community radio is –“radio for the people and by the people”. Community radio is characterized by access, public participation and decision-making, and by listener financing. “VOICES” is an NGO that looks at using media for social change and has been actively lobbying for Community radio in India.

2.3.13. Namma Dhwani

VOICES together with MYRADA, another NGO, and UNESCO have initiated “Namma Dhwani,” India’s first cable audio initiative, in 1999, in Budikote village, Kolar district, Karnataka. In the absence of legislation that allows for use of airwaves, the Namma Dhwani initiative uses audio cable connections to transmit information to the school and individual homes. The format of the programmes for the school consists of newspaper reading, local news, general knowledge, music, model lessons, and programmes about issues like dowry, environment preservation, and so on. Programmes for the general public are decided by the community themselves and include
entertainment and information on locally relevant matters. More than 350 programmes have been cablecast so far.

**Sustainability**—The study and subsequent implementation of the project, including setting up of the infrastructure, training the people, and preparing the first few programmes were funded by UNESCO. Subsequently, the entire activity is being managed by the village residents. VOICES and MYRADA continue to have a presence in the village. For such an initiative to be sustainable and replicable, the audio production centre, transceivers, and communication channels need to be reliable and yet inexpensive to build and maintain. There is also a need for a trained manpower to attend to breakdowns if any.

### 2.4. Key Learnings

The power situation in the state is a major bottleneck to ICT initiatives. Electricity is barely available for six hours a day in most villages and that too at usually odd times. Most of the programs have addressed this issue through UPS (Uninterrupted Power Supply) systems and diesel generator sets, but these can provide electricity only for a few hours which might be adequate for the use of individual applications but are not adequate if a combination of services is to be provided over a longer period of time. With the cost of renewable energy devices being prohibitively high and the problems encountered in the availability and storage of diesel to run diesel generator sets, implementation of a set of economically viable ICT-driven services is severely hindered.

Asror initiatives that require Internet connectivity, the connectivity available across rural India is not very reliable, but efforts are on to enhance the same, using a variety of technologies. In some cases, more expensive home-grown connectivity solutions are being implemented to promote indigenous enterprise, but the tradeoff in cost needs to be studied carefully, especially since the rural market has a limited paying capacity.

Karnataka is highly advanced in IT/BT/BPO Industry/Services. E-governance initiatives supported by the Department of IT, Government of Karnataka are gaining momentum. Daily Radio lessons are integrated with school timetable. Teleconferencing in teacher training is extensively used. All high schools are supplied with computer laboratories. However, integration of syllabus with computer technology for transactions, availability of CD libraries in schools, and capacity building of teachers need immediate attention.
2.5. Bibliography


Department of State Educational Research and Training: Wings and Activities, Chapter 1: Introduction http://dsert.kar.nic.in/html/chapter01.html

Department of State Educational Research and Training: Wings and Activities, Chapter 6: Education Technology Cell http://dsert.kar.nic.in/html/chapter06.html

Department of State Educational Research and Training: Wings and Activities, Chapter 9: Programs under SSA http://dsert.kar.nic.in/html/chapter09.html

Department of State Educational Research and Training: Wings and Activities, Chapter 10: Collaborative program with NGOs http://dsert.kar.nic.in/html/chapter10.html


World Links India (http://www.world-links.org/en/countries/alumni/india.html)

“Namma Dwani,” VOICES India, (http://www.voicesindia.org/?p=75)
2.6. Stakeholders

The details of persons contacted for Case Studies are given in the following table:

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rajeev Katyal</td>
<td>Director, Education</td>
<td>Microsoft</td>
</tr>
<tr>
<td>Krishna Nagaraju</td>
<td>Strategic Account Manager</td>
<td>NIIT</td>
</tr>
<tr>
<td>H.N.S. Rao</td>
<td>Academic Head ICT</td>
<td>Educomp Solutions</td>
</tr>
<tr>
<td>Linson Joseph</td>
<td>Channel Platform Manager</td>
<td>Intel, South Asia</td>
</tr>
<tr>
<td>Sukumar Aniker</td>
<td>Head, Technology for Education</td>
<td>Azim Premji Foundation</td>
</tr>
<tr>
<td>Nived Dinesh</td>
<td>Head—Content Licensing and Development Services</td>
<td>Edurite India</td>
</tr>
<tr>
<td>Satya Narayanann</td>
<td>Fellow</td>
<td>American Indian Foundation</td>
</tr>
<tr>
<td>R.G. Nadadur</td>
<td>Principal Secretary, Primary &amp; Secondary Education</td>
<td>Karnataka—Department of Education</td>
</tr>
<tr>
<td>I.F. Magi</td>
<td>Special Officer</td>
<td>Karnataka—Department. of Education</td>
</tr>
<tr>
<td>Devaprakash</td>
<td>Joint Director</td>
<td>Department of State Educational Research and Training (DSERT)</td>
</tr>
<tr>
<td>Jayaramu</td>
<td></td>
<td>Department of State Educational Research and Training (DSERT)</td>
</tr>
<tr>
<td>Rangaswamy</td>
<td>Officer in charge for Radio Programs—DSERT</td>
<td>Department of State Educational Research and Training (DSERT)</td>
</tr>
</tbody>
</table>

2.7. Annexure I

Impact

The evaluation study conducted by Center for Multi-Disciplinary Development Research, Dharwad, has highlighted the impact of the Mahiti Sindhu Program as follows:

- Significant improvement in enrollment and attendance in these schools
- Reduction in dropouts
- Increase in computer literacy among students
- Improvement in SSLC results.
- Improved English language skills of the students
- Majority of teachers are trained in computers and are able to computers in class room teaching
The Intel-IMRB survey 2006 has highlighted the following:

Even though Karnataka has displayed a high infrastructure growth post implementation of the Mahiti Sindhu program, infrastructure and support issues are major challenges faced by the state. Inadequate access to Internet and lessons not fitting well into the curriculum are the main reasons for not implementing technology-based lessons among teachers. Computer knowledge is a motivating factor and there is high satisfaction among teachers about the program across districts.

With any monitoring system in to place to carry out the effective study of a program, flaws should be detected during the pilot phase itself and it should be ensured that it is corrected in the final policy/implementation. For instance, the ambitious Mahiti Sindhu Project has not been able to achieve the desired results as per an NGO "IT for Change":

**Mahiti Sindhu Program—A Review by "IT for Change"**

According to a study conducted by Bengaluru-based non-governmental organization “IT for Change,” the government’s Mahiti Sindhu programme in Karnataka using the outsourcing-based model, which took computer education to 1,000 schools across the state, has not achieved its goal. According to the study, the larger goal of establishing IT-enabled education in government schools has been abandoned. Further, the use of proprietary software has limited the scope of IT-enabled education in the schools. The programme, which outsourced the setting up and teaching process to private vendors, has not benefited the overall school system says the study.

The report also found that vendors, who designed content and process, were in the business of selling computer hardware/software or general computer training and not equipped to teach education-specific tools. The vendor-deputed trainers were poorly paid—salaries ranged between INR 2,500 to INR 4,000 (approximately USD 50 to USD 85) per month—and thus contributed little in terms of quality or expertise to the job.

In contrast, Kerala’s IT@ schools emphasized was on developing systemic in-house capabilities anchored around the role of school teachers, said the report. High school teachers in Karnataka, unlike their counterparts in Kerala, were not trained to apply computer skills to regular lessons despite having computers in their schools.