Nature and Extent of use of ICT in classrooms

Report

R.V. Educational Consortium
Rashtreeya Sikshana Samithi Trust
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Executive Summary

The study was conceptualised to address the following questions:

i) To what extent are teachers making use of ICT (Computer, Television and Radio) in their classrooms?

ii) What strategies do teachers adopt while making use of ICT?

iii) How are students learning in these classrooms?

The primary objectives of this study are:

1. To identify:
   - the levels to which teachers integrate ICT in their classrooms
   - the strategies adopted by teachers while making use of ICT
   - possible ways in which students construct knowledge in ICT-enabled classrooms
   - ICT enabled pedagogy that would assist knowledge construction

2. To evolve a training module that would promote ICT integration in classroom teaching

This is primarily a qualitative study. School was taken as a unit of case study. Classroom observations, interviews and focussed group discussions were the primary means of data collection. Purposive sampling was used for the study. 24 schools formed our sample.

Trends discerned from case studies:

- Students view computer as a tool for playing games
- Where teacher takes interest in conducting radio lessons, students find radio more useful
- Radio lessons for class 3 to 5 have helped children gain conceptual clarity
- Teachers’ acceptance of radio is greater than other technologies
- While teachers see value in computers as resources, more than half of them do not feel confident enough to handle computers.
- Ten schools of the 24 we studied has a support teacher. Out of these, in three schools the SDMC had appointed them and in the remaining schools they were
appointed by an NGO. Barring two, where subject teachers had also involved themselves there was no attempt at integration

- In nearly all the schools where integration was attempted, the HM was co-operative and a good team player

Teachers’ level of ICT use fell between Orientation (beginning to find out about ICTs) to Routine (using ICT in a basic way). These levels of ICT use was adopted from the UNSECO Report (2002) on *ICT in Teacher Education*.

Some of the issues that preclude integration, as identified from study are:

- Teachers are unable to visualize integration because of the top-down approach adopted
- Management of class and time is a problem for many teachers, especially where class size is large
- Summarisation is for most part mechanical
- There is little scope to encourage thinking/ reflection among children
- There is no scope for teachers to adapt ICT to suit their classroom requirements
- Teachers generally view radio/CAL/Edusat as programmes and not as resources
- Teachers are feeling overwhelmed with too many programmes
- For higher classes radio lessons are only an extension of traditional teaching
- Both children and teacher are focused on taking notes diligently during radio and TV programme in most schools
- Edusat lessons do not adequately harness the power of the visual medium
- Not many teachers are comfortable handling computers
- Training and orientation for teachers in computers is inadequate

ICT programmes appear to augment and reinforce teachers’ pedagogical beliefs rather than challenge them. Finding optimal ways to use technology for students will take time, exploration and experimentation on the part of teachers. They are simply not getting the time or wherewithal for this. Training programmes need to veer around practical and pedagogical issues instead of only ICT applications. Training must adapt to teachers’ needs if we expect them in turn to adapt to their students’ needs. Also, teachers need to be empowered to recreate content, collaboratively.
1 Introduction

“While the rest of the (American) society goes through a technological revolution, (American) schools are lingering in the stone age”. Edward Fiske, 1991.

1.1 Historical Perspective

Developments in media and technology during the past three decades, especially after the advent of the internet have transformed the way we communicate, the way we conduct business and the way we entertain ourselves. But these have not necessarily paved way for sweeping changes in our schools. There have been many technological dawns throughout the twentieth century – radio, films, television, computer and now the Internet. With each new technology, there have been enthusiastic expectations of a transformation in the teaching learning process and at times even the end of formal schooling. However, classroom processes have changed very little, if at all over the decades in most schools. In fact, the printing technology appears to have had far more influence (Passi, 2000). Audio and visual media have generally been considered as add-ons in classrooms rather than as something at the heart of learning.

The earliest large scale utilization of technology in India was way back is 1975-76 by deploying the Satellite Instructional Television. By 1990, a number of colour television sets and radio-cum-cassette players were supplied to over two lakh schools across the country at the cost of several crores of rupees (NCERT, 2005). Soon after, Computer Literacy and Studies in Schools (CLASS) was launched for high schools.

In elementary education, Sarva Siksha Abhiyan noted “that use of ICT may help in achieving its objectives of reducing drop out, enhancing achievement levels, and making learning joyful” (SSA, 2005).

Accordingly, a committee was constituted for evolving guidelines for ICT education under SSA at elementary stage.

The committee recommended the following interventions, to be taken up in two tiers:

- Training teachers
- Creation of infrastructure
• Development and production of state specific e-teaching/learning materials in local language
• Sensitisation of state-level statutory bodies

Other than these country-wide Central Government schemes, there were many small scale programmes in partnerships with both global and local players.

In Karnataka, for example, a joint initiative between Azim Premji Foundation and Government of Karnataka saw 225 Computer Aided Learning Centres set-up across Karnataka between the years 2001 and 2004. These centres covered 80,000 children of Government Primary schools. Other examples targeting teachers and high schools include the Mahithi Sindhu Programme, World Links India Programme, Intel Teach Programme and more recently Microsoft’s teacher training initiative. All of these have been evaluated in some form or the other. A few studies relevant to the present research are included in the next section.

1.2 Literature on use of ICT in schools

Worldwide there exists a plethora of studies and reports on practice. Since the present study’s focus is on elementary schools, some of the meta-analyses of ICT related programmes in other countries, a few interesting case studies and reports of evaluation of ICT programmes within India are briefly enumerated below. However, this section is not meant to be an exhaustive or comprehensive review of the literature in this area of study.

In a research report summarising the evidence for the effectiveness and impact of media and technology in K-12 schools around the world, the author concludes that longitudinal studies show positive learning results from the infusion of media and technology into schools but the process is much slower than what most people expect (Keeves, 2003). More specifically, this research found that there was preponderance of use of ICT to learn “from” media wherein students are exposed to media via the appropriate technology. Television and computer were the two primary technologies used. The research reported positive effects on learning from television programmes that are explicitly produced and used for instructional purposes. Similarly findings concerning the impact of computer based instruction in schools show improved performance in standardised achievement...
tests and increased levels of motivation among children. In addition, teachers have been able to complete a given set of educational objectives in lesser time than while teaching without computers.

In a UNESCO Report on *Experts’ meeting on teachers/facilitators training in technology*, case studies showcasing innovative practices in use of ICT are included (UNESCO, 2003). In Mongolia, radio and audio cassettes have been extensively used to help primary schools adapt to changes in curriculum, pedagogy and management of learning strategies. This project cuts costs in terms of travel and accommodation of teachers. This money was utilized to provide quality learning resources through distance mode which also included workshop activities.

In Thailand a school-based project has been launched. It involves training teachers in schools where they teach. Award-winning educational software is selected and teachers are shown how to utilise these programmes in school subjects. Features of this programme include:

- Teachers in schools work as a team with trainers or facilitators
- A teacher in each school acts as a co-ordinator with responsibility to help colleagues with any technical problems
- A supportive environment helps teachers become familiar and comfortable with computers
- Teachers learn about hardware and software using same computer facilities they have access to, in their schools
- Training sessions in small groups with hands-on experience
- Teachers can immediately put to use what they learn in the subjects they teach

In India, large scale evaluation of educational television (ETV) and radio programme across the country have shown gross underutilisation. The programmes do not indicate suitability either for supporting classroom transactions or supplementing them for particular subjects. Three committees had been appointed to study the problems related to educational broadcasting but no action has been taken (NCERT, 2005).

Similarly, an evaluation of CLASS concluded that the project met with limited success and has described it as ‘spectator sport’. These ICT interventions made some impact
only where schools and “teachers went the extra mile to avail the facilities provided using their own ingenuity” (NCERT, 2005).

In another study of a Computer Assisted Learning programme targeting class 4 children launched by an NGO in the corporation schools of Pune wherein Mathematics competencies were reinforced through games, it was found that there was a statistically significant increase in the students’ Maths scores (Linden et al, 2003). The study also found that the programme was more effective for children at the bottom of the distribution of the baseline scores.

In Karnataka, a study to evaluate the Impact of Community Learning Centres (CLC) arrived at the following conclusions (APF, 2002):

- There has been a positive change in enrolment rates
- Performance of students in CLC schools was significantly better than non-CLC schools only in class 4 students in the case of Kannada and in classes 4, 5 and 6 in the case of Maths.

Under this programme, computers and a set of CDs containing interactive games covering primary school content were provided. The programme also made provision for appointing a local person to anchor it.

A later qualitative study of the same programme reported the following findings, among others (Rishkesh, 2005):

- Teachers and HMs are not taking active role in the programme
- All stakeholders believe presence of an additional person to run CAL programme is absolutely necessary

Research and reports on practice point out that while provisioning/access to technology can bring about an initial spurt of motivation, sustenance and improved levels of students learning occurs when good teaching is combined with technology, over a period of time.
1.3 National Policy on ICT in School Education (draft) (2009)

The Department of School Education and Literacy, MHRD, Government of India has drafted a policy to assist states in making optimal use of ICT in school education. The policy sets forth guidelines for three stages of ICT implementation at schools: ICT literacy and competency Enhancement; ICT enabled teaching-learning; Introduction of ICT related elective subjects at senior secondary level.

Since ICT enabled teaching-learning is of particular interest to the present study, the guidelines enumerated in the policy document are reproduced below:

- ICT enabled teaching-learning encompasses a variety of techniques, tools, content and resources aimed at improving the quality and efficiency of the teaching-learning process. Ranging from projecting media to support a lesson, to multimedia self-learning modules, to simulations to virtual learning environments, there are a variety of options available to the teacher to utilise various modes/ICT tools for effective pedagogy. Each such device or strategy also involves changes in the classroom environment, understanding of which has a bearing on its effectiveness. Availability of a wide range of such teaching learning materials will catalyse transformation of classrooms into SMART classrooms.

- All teachers, all of whom would have acquired a basic competency to handle these resources, will be encouraged to adopt ICT enabled practices in teaching learning. A wide range of appropriate software applications, digital content, tools and resources will be made available through the proposed digital repositories. Teachers will participate in selection and critical evaluation of digital content and resources. They will also be encouraged to develop their own digital resources, sharing them with colleagues through the digital repositories.

- In schools equipped with EDUSAT terminals, DTH or other media devices, relevant activities will be planned and incorporated into the time schedule of the school.

- Initially the teachers may use the Computer lab for teaching-learning but progressively more classrooms will be equipped with appropriate ICTs, making way for SMART classes

The present study attempts to document the teaching that goes on in technology enabled classrooms in a few selected schools. These policy guidelines have been used as a framework in studying the schools. The next chapter details the methodology used in the study.
2 Study Design

The study was conceptualised to address the following questions:

iv) To what extent are teachers making use of ICT (Computer, Television and Radio) in their classrooms?

v) What strategies do teachers adopt while making use of ICT

vi) How are students learning in these classrooms?

2.1 Objectives

The primary objectives of this study are:

1. To identify:

   • the levels to which teachers integrate ICT in their classrooms
   • the strategies adopted by teachers while making use of ICT
   • possible ways in which students construct knowledge in ICT-enabled classrooms
   • ICT enabled pedagogy that would assist knowledge construction

2. To evolve a training module that would promote ICT integration in classroom teaching

Definitions

The following definitions convey the meaning of the terms ICT and Integration as used in this study.

*Information and Communication Technology (ICT)*: Relates to those technologies that are used for accessing, gathering, manipulating and presenting or communicating information (Toomey, 2002).

*Integration*: Involves making use of different learning methods, techniques and ICT-related resources and applying them in an interactively meaningful way to promote learning (Adapted from Mikis, 2007).
2.2 Methodology

This is primarily a qualitative study. School was taken as a unit of case study. Classroom observations, interviews and focussed group discussions were the primary means of data collection. A team of ten experienced field researchers were oriented towards the purpose of the study and use of the guidelines for data collection.

Two researchers visited each school. The team made a preliminary visit to each school to collect school details and interview the HM and teachers. In subsequent visits, classes were observed and interactions were held with children. The researchers observed a radio lesson, a TV lesson and a computer-based lesson, where available, in addition to observing two regular classes (one from LPS and one from HPS).

2.3 Sample

Radio programme is extended to all Government schools across the state. SSA in collaboration with APF has set up Computer Assisted Learning Centers (CALC) in 600 schools in Karnataka. Other than this many private organisations and NGO’s have been donating computers to elementary schools. Hence it is difficult to identify the number of elementary school in the state where CAL is operational. Edusat is extended to nearly 2000 schools across Karnataka. Edusat for elementary schools was first started in 885 schools in Charnarajnagar district. Subsequently it was extended to Gulbarga, Yadgir, Ramanagara and Bangalore rural. Purposive sampling was used for the study. BRP’s of the four zones of Bangalore were contacted. The purpose of the study was explained to them. Schools where ICT (radio/computer/edusat) programmes were running effectively in their blocks were suggested by them. These 24 schools formed our sample.

Two of these 24 schools were lower primary schools. The list of sample schools is provided in the Appendix 1.
2.4 Tools

A set of seven forms were developed for data collection (vide Appendix 2). The field researchers were instructed to observe a higher and a lower primary class, in addition to radio/TV/computer lesson, where applicable.

Form 1: School Details

This form sought basic details of schools. The form was filled in consultation with HM of the respective schools.

Form 2: Teachers’ Questionnaire

All teachers were asked to fill in the written questionnaire. A group of 4-5 teachers were interviewed using the guidelines.

Form 3: Guidelines for Observation of Computer class

One computer class that was in progress was observed.

Form 4: Guidelines for Observation of Radio lesson

One Radio lesson that was in progress was observed.

Form 5: Guidelines for Observation of Edusat Programme

One Television class that was in progress was observed.

In forms 3, 4 and 5 apart from filling the forms field researchers also noted other qualitative observations separately.

Form 6: Guidelines for Classroom Observation

Field researchers observed classes of two teachers whom they had interviewed. Preference was given to a teacher who had handled computer/Radio/Television lesson.

Form 7: Guidelines for Interaction with Students

8-9 students of class 4 and class 7 were randomly selected for interaction. Interactions with students of these two classes were conducted separately.

A meeting of seven experts in the area of school research and use of ICT in primary schools was convened. The study design and the tools developed were discussed. It was
the unanimous suggestion of this meeting that sample schools should be drawn based on the local BRP’s/CRP’s suggestions. In addition, an experienced researcher went through the tools in detail and provided insightful comments. Accordingly, the tools were modified and then piloted in two schools.

2.5 Data Analysis

The basic quantitative data collected have been subjected to frequency analysis. From the data pertaining to class observations, common threads and specific patterns vis-à-vis the objectives of this study are identified.

2.6 Scope and Limitations

The scope of this study is to study classroom processes in schools where ICT is working effectively. Hence a case study approach was deemed suitable. The sample has been chosen from Bangalore and its neighbourhood. Also, as the focus of the study is on ‘effective’ schools, a purposive sample has been used.

These factors preclude generalisation. The study’s findings have to be seen in the light of helping gain a better understanding of the nature of ICT use in schools that have been identified as using technology effectively.

The following chapter provides brief case studies of the sample schools to understand their contexts better.
3 Case studies

Case studies of individual schools are grouped under the respective technology (ies) available in these schools. The case studies have been written by the field researchers who studied the schools. To maintain anonymity of the schools, under which assurance data were collected, schools have not been named in this chapter.

3.1 CAL, Radio and Edusat

School 1

School:

This is in a small village located about 30 kms from the main road. The school is small, clean and well-maintained. Part of the school playground is converted into a garden which through aesthetically pleasing has taken away children's outdoor playing space within the school premises. The school is apparently short of one classroom as classes for V standard are held in the corridor. Documentation of school activities seem to be quite extensive. The headmaster's office had various kinds of charts about the activities in the school.

Teachers:

The teachers are quite efficient in documenting and showcasing. The Nali-Kali teacher does not believe in the methodology, and says that teachers should be given freedom to create their own situations to teach. During teacher interviews the teachers said that the radio and TV programmes are useful because children participate in these programmes actively. But this was not substantiated in our observation of the radio lesson. Teacher was a passive observer during a rather dull radio programme. The teachers are not interested in integrating computers to aid in classroom teaching.

Computer Class:

The seventh standard children were brought into the computer lab. There were 4 children on each computer. Each student has a personal pen-drive. The children were clueless
about the purpose of the pen drive but were happy to be in possession of it. The children said that they had seen all the CDs and were familiar with the basic operations. A few children seemed quite at ease using the mouse and moving forward with the APF CDs.

**Radio Lesson**

We observed English radio lesson titled "Oh, No! That's too much!" for 6th standard students. The teacher and children were not in any way prepared for this lesson. The children were quiet and trying hard to be interested. The programme itself was very drab and too fast for the students to catch on. The programme made very little effort to involve the children dynamically to learn the language. At the end of the programme home work instructions were given in Kannada to make a list of words ending with 's'. The whole exercise appeared to be meaningless from the children’s perspective.

**Edusat:**

The students of this school were not able to see the Edusat programme in their school for the past few months due to some electrical problem. Hence the students were taken to the nearby school to watch the Edusat programme.

A geography lesson on Latitudes, Longitudes, continents oceans and seasons was taught. During the first few minutes a classroom was shown. The classroom was furnished with white and green boards with independent desk and chairs. The programme comprised of a teacher teaching in this classroom using various videos, computer animation relating to the subject. The description/narration was good but it appeared as though the students were finding it difficult to understand. No attempt was made by the social science teacher to help the children. The students were able to tell the name of continents and oceans when prompted by the Head Master during the session.

When we interacted with the students after the programme they told us that the lesson that was telecast was taught during the previous semester. They said they were happy watching Edusat programme. But when queried about what they learnt from the programme, they were only able to name a few visuals.
**Classroom observations**

After much cajoling, a lesson which had already been taught was demonstrated for the sake of the researchers. The teacher played a long folk song on the tape recorder and then had the children sing the song. The lesson selected was a humorous story set in a rural context. The teacher read the lesson seriously and asked the children to read it out aloud. The children also read it equally seriously. The teacher thus killed the humour and the interest that the lesson could have generated. After the lesson, the regular exercise of making sentences and identifying the differences between colloquial and literary language were discussed.

Many charts were displayed in the classroom. Some displays meant to reinforce English language sentence structure had grammatical as well as spelling errors in them.

**Students**

Students were extremely well-groomed and highly disciplined. All of them said they come to school to get educated. Class 4 students enthusiastically recited English rhymes for us. They interacted with us freely while the seventh students were a little hesitant. They were very quiet and almost seemed tense. Through the children's interaction it was felt by the team that children were neither regularly listening to the radio programmes nor were they watching Edusat programmes. Also, the computer lab was not being used regularly.

**School 2**

This is a GHPS in a small rural community very far away from the main road and over 120 km from Bangalore, with fields right at the back of the school. The school has a nice playground. The children were playful, spirited and confident. The school has 2 computers (1 desktop and 1 laptop), radio and television in working condition.
**Teachers**

The headmaster of the school appeared extremely enthusiastic and sincere. He seemed to be making efforts to give children exposure in all possible ways. The teachers were co-operative. The social science teacher and the headmaster showed interest in using technology in the classroom. The social science teacher was the only one who had little knowledge about computers. They told us that the radio programmes especially chuki chinna is well received by the students. The HM felt that the exposure and education on computer to all the teachers would help the school.

**Computer Class**

Children of class 6 and 7 have computer period everyday. Each student has a pen drive. A few topics in Science and Social Science have been downloaded. A laptop along with the pen drive has been given to the school by an NGO. The social science teacher is the only one who teaches the children computers. She has taught them to draw, paint, and to save fees. Few children were very eager to show us their drawings.

**Radio Lesson**

An English lesson for class 6 was observed. The teacher actively participated when the programme was on. The contexts portrayed in the lesson such as stationery shop and provision store were not familiar to the children. The conversation and instructions in English were too fast and children were not able to follow. The lesson was not aligned to their current syllabus. It was from the previous semester. The rhyme that was taught made no sense to the children. They were able to answer the homework portion of the lesson as the teacher intervened and helped them understand the instructions.

**Edusat**

EVS programme on 'Sea' for 3rd and 4th standard children was observed. The children watched and listened attentively. The teacher was also involved and encouraged the children to be interactive when questions were posed by the narrator on TV. The children enjoyed the programme.
Classroom observation

A lesson in English for class 7 was observed. The teacher was fairly comfortable with English. The teacher read out the lesson. He then picked out ‘difficult/unfamiliar’ words and wrote Kannada meanings on the black board. There were plenty of spelling mistakes. The children seemed interested and were able to follow possibly because of ample usage of Kannada in the classroom.

Students

Students were fairly groomed and were confident while interacting with us. Most of them said they come to school to read, write and be active. The TV programme is enjoyed by all students. Among the radio programmes, they like Chinnara Chukki better than Keli Kali. The children enjoy the activities in the radio programme. According to the children, the major difference between radio and Edusat is that over the radio instructions are given only once, while on TV the instructions are written and shown. In the computer class they find it difficult to understand instructions in English to get ahead and hence they like drawing and painting on the computer. They also play on the computers in groups of 6 or 7.

School 3

School:

The school is about 80 km from Bangalore. It has school strength of 424 students and staff strength of 14 teachers. This school has CAL, Radio and Edusat programmes. It has a dedicated computer room with a computer teacher to facilitate the CAL and Edusat programmes. The school campus has quite a big playground and cleanliness is maintained in the premises. Good arrangement is done for drinking water and other amenities. The surrounding environ is comparatively less noisy and conducive for learning.
Teachers:

During the first day of our visit, most of the teachers were not present in schools as they were attending a training workshop conducted by Teachers Foundation. So on the first day we interacted with the HM and a couple of teachers about school details and ICT programmes in general. On our subsequent visit, we met a few more teachers. The teachers seem to be quite committed and sincere in their efforts regarding implementing ICT in school. They share a loving relationship with the students. A couple of teachers appeared to be highly efficient. These teachers have a good working knowledge of computers, having undergone computer training programmes themselves or having been trained by their colleagues. There is a kind of sharing culture among teachers that has helped them to be updated.

Computer Class:

Only one of the six computers that the school has was working at the time of our visit. There are over 70 CD titles created by APF. In the class we observed class seven students were shown a CD on respiratory organs. The teacher gave a brief introduction on the topic and made all 35 students view from the same computer terminal. After about 10 minutes of introduction four students took turns in operating the computer and playing on the interactive CD while others watched.

Radio Lesson:

We watched a Maths lesson for class five on division of fraction by whole numbers. This topic had not yet been taught to the students. Group activities were done well. Children participated enthusiastically and the teacher was also active.

Students:

The students are well mannered and tidy. They hold their teachers and school in high esteem. They are quite articulate about the way the school functions and came up with some keen observations. For eg: a student told me that one of the advantages of radio programme is that even the teachers tend to gain information or sometimes correct their own mistakes and the radio lesson fills in any gaps that they the teacher left void in regular classroom teaching. Some of them are very well informed about computers and
even internet. The children have liked the programme on historical places they viewed on TV.

Even outside the classroom they seemed to be well behaved and disciplined. A few students told that they get more affection at school than they do in home.

SDMC:

The SDMC is a major issue here according to the HM and teachers. During a chance interaction with the SDMC President, I found that not only is he an ill informed person but totally ignorant of the intricacies involved in the functioning of the school- thus only corroborating what the HM and teachers revealed.

School 4:

School:

This school is on the main road about 50 kms from Bangalore. The day we visited they had a cluster level resource exhibition. This school boasts itself as the only school in this area with computers.

Teachers

The teachers seem to be welcoming and keen on showcasing. The teachers are proud about the CAL programme in their school. They also told us that the school strength has increased as the result of computers. The teachers believed that the radio and the TV programmes were useful as they reinforce the lessons thought. But they admitted that they were not able to continue the radio as well as the TV programme. Non availability of radio (battery) was given as explanation for discontinuing the programme. On the other hand they said that the TV was on repair and no initiative was taken to do the needful. Most of the teachers in the school had been computer trained but no subject teacher accompanies the students during the computer classes. The computer classes are handled by the craft teacher.
Students:

Most of the 7th standard students have been using computers for the past two to three years. They were quite confident while they spoke about computers. They also told us the computers are very much activity oriented with lots of game and child friendly cartoons. During games and free periods few children go to the computer room to watch CDs. Especially Puttuvina madhuve, Oorige bandtu circasu, and CDs with English rhymes.

Most of these students had learn to paint, type, switch on and off the computer.

Many students were excited to talk about the earth, planets, soils and minerals, body organs and formation of day and night that they watched on the CDs. These children told us that they were able to understand all these reasonably well only with the help of CDs. They also point out that CDs were interactive and made it simple for them to understand. A few children have joined from nearby government schools. They also told us that one of the reasons they had shifted is due to computers.

These children had watched edusat programme for almost a year. They were able to recollect a few concepts that they saw on the television especially in maths.

The then math teacher had usually taken the children to view TV lessons after introducing the mathematical concepts in the class. After every TV session the teacher had conducted quiz for the children in the class and she had given them prizes. The students told us that this made them more alert while the programmes were broadcast. Few student told us they had always looked forward to English lessons on TV as they were more interesting. They all liked the objective questions asked at the end of every week.

Most of 5th standard students we interacted with, have enjoyed the radio programmes the previous year. They liked the characters songs, activities and the way they communicated. They believed that the characters were talking like a friend, who taught them too. 7th standard students do not appear to have liked the radio lessons much.

When the students were asked to array their inclination among various technology and their teachers this is how they answered us:
1. The students preferred a teacher the most as she can repeat the lessons again and again.

2. Computers took the second place. They said they can play the programmes they required anytime. The activities and they were also interesting and lifelike. Interaction with the computers makes it more interesting for students.

3. TV programmes stood third. The students said they enjoyed the visuals.

4. Radio took the last place. Even though radio programmes were interesting it was difficult for them to envisage especially for math and science subjects.

**Computer Class:**

The students were at ease handling the computers. They were taught ratios. Few children had already seen the CDs beforehand. They knew what to do and how. In fact they were helping the teacher. There were about 4 students per computer. They all had lot of discussions to solve the problems. The students tried to solve it themselves as the teacher was clueless about the CDs and the games played on it.

The most admirable part was that the slow learners showed more interest in learning the concepts and tried to win the games on the CD. Students who have joined from other schools were not comfortable handling the computers. Students from the same school i.e. studying from 3rd std were very confident while handling the computers. These students came forward to help the new students.

The previous support teacher had made sure all the students watched the same CD. But now the craft master who takes care of these computers allows the children to watch the CDs of their choice. The old students literally teach the new students to use the computers. The old students have seen all the CDs available in the school and require more CDs.

**Edusat:**

Due to battery problems edusat is not working in this school from June’09. The students said they didn’t miss the television programmes now. The students said that they had computers which is more interactive.
Radio: The students were not listening to radio programme from June’09. The radio was not working. No measure has been taken to repaid/replace it. More than the 7th standard students, the 5th students said they missed the radio programmes.

School 5:

School:

The school is in a small village near Channapatna. Opposite to this school is the High school and PU College. The school is well connected to the highway and city of Chennapatna through bus service available at regular intervals. The play ground and stage on one end are quite impressive for school assembly and activities. There is also a black board displaying the day’s Radio and Edusat programs and their timings and target class. The school has an Anganwadi centre in the same compound. There are good number of vegetables grown mainly initiated by the present HM to provide for the mid day meal.

This school has been implementing CAL for the past 4 years and has been selected for another technology intervention by APF. Under this initiative 2 lap tops with internet facility are given to the school and teachers are trained to use the lap tops, carry them home sometimes and also generate classroom resources by downloading from the Net. And additional digital content in the form of brief capsules (from Bharatiya Vidya) were given by APF. These capsules have no voice over text thus allowing the teachers to integrate them into their lessons and explain concepts with their text.

TV is housed in the HM’s room for Edusat classes. At the time of our visit, 2 teachers had gone for training and 1 teacher had a family function in the same village, one teacher was in Nali Kali class, one teacher was just idle but the HM took a lot of initiative and literally took all the classes, one radio session, Edusat class, computer class and regular classroom session.

The HM, who taught mainly Maths and English, was newly posted to this school. He is very enthusiastic and highly motivated to develop the activities in the school, and understands what is required to generate interest among the students towards educational
activities in the school. He is very resourceful; he showed us a lot of educational tools which they show cased at the District level TLM meet held recently. He explained to us how an educational CD on maths helped them actually prepare a TLM, Geo board. Thus the technology based content was useful for students to learn and also useful for the teachers to prepare innovative tools for teaching-learning purposes.

**Teachers:**

For most part of the interactions with the HM, the other teacher was completely silent and did not even go to any classes. Initially we thought he was from the community or SDMC member or somebody else associated with the school. And during lunch time he went to attend the function at the colleague’s house and returned very late. Again, the HM showed us the computer class which he took for class 7 students. He showed them all the Bharatiya Vidya capsules in one go with some explanations. There was no systematic integration at all. He said that he is still new to computers and this methodology and therefore would learn in the near future and then be able to take a class more confidently.

Nali Kali classes seem to be conducted with good fervor and the teacher could easily motivate the students to dance and sing and show their talents.

**Computer:**

The school is well equipped with 5 computers and a printer given by APF in the initial phase, then a 3 Monitors-1CPU model from APF and another DOT matrix printer from the community donor, 2 lap tops with Internet connection for the teachers for portability and to create, store and use resources from the internet and another printer. They also have a Digital camera for taking pictures. Two teachers from this school have been trained but unfortunately one teacher is now posted with Nali Kali teaching so cannot take forward the implementation of integrated digital content for classes 4 to 7. She was further trained to use the lap top for internet resources. So she is using some of these resources for classes 1 to 3. Looks like she is the identified ‘training candidate’ for all government trainings!
Radio:
The radio lesson was taken by the HM and the other teacher just sat and wrote down in
the book. The lesson was from maths and students showed active participation but the
audio was not clear at times. The way this HM handled the class, it was clear that he had
good subject knowledge and was also comfortable in conducting the activities as per the
radio lesson. He also gave good practical examples from their day-to-day life and
connected to the example given in the radio lesson. The school has 2 tape recorders
which are portable and carried to the classrooms for the radio programs.

Edusat:
Edusat programs are shown to the students regularly as per the given schedule. However,
we did not see any preparation of the students or follow up activities after the ‘show’.
The ‘show’ was held post lunch in the HM’s room where the TV was placed along with
sound system. The lesson was about Kanishka and the TV program was very poor in
creating any enthusiasm or interest among the students. There were too many difficult to
use names from the dynasty and some comparison of architecture was presented in the
form of a table. None of the students wrote any legible, reusable and clear notes for later
use.

Students:
Student interaction was as usual very lively and energizing. The students of class 6 and 7
sat together in the same room. During the interaction with the students, they came across
as being more interested in computers. They all felt computers are very much essential
and they like using the computers for CD viewing and playing games the most. They had
regular computer periods last year but not much this year.

School 6
School
The school is large with a big playground. It is located about 10 km from Channapatna
town. The school premises except the toilets are kept clean. The children are seated in
rows in the classroom. All higher primary classes had benches and desks.
Teachers

The teachers were of the opinion that only songs were useful from the radio programmes, and a few Maths and English lessons on the Edusat were useful. When we discussed about computers, the teachers spoke enthusiastically and seemed quite enamoured by technology. They were quite impressed by seeing wireless internet shown by APF personnel. Naturally they felt that internet would be a very useful tool for them. But with all their fascination for computers and Internet none of the teachers were really adept in handling computers.

Computer Class

Children were not able to use the computers. They had difficulty in turning it on and were struggling to use the mouse. It was obvious they have barely used computers, quite contrary to what teachers told us.

Radio Lesson

Radio was not working

Edusat

A history lesson on Kushana dynasty was being aired for 5th standard students. A few children were interested in the programme. The programme was soon after the lunch break, so children just kept pouring in one by one. A few were making notes. The programme itself was unimaginative. An opportunity to make history interesting using the visual medium was completely lost in the uninspiring narration of facts by three different people. At some points, the narrator was not even clear in pronunciation. For the children this experience would not have been much different from their teacher reading about it with a few interesting pictures.

Classroom observation

A biology class for class 8 was observed. The teacher was extremely well prepared and was very effective in driving his points. Excellent board work to go with the explanation on parts and function of the respiratory system. His drawing skills were very good.
Children were in rapt attention while he was teaching. He holds a Masters degree in Biology.

**Students**

Class 6 children were interactive, but initially seemed to be coming up with standard 'We like everything' sort of answers. But a bit of probing led them to tell us that they have not been having computer classes regularly and are not familiar with computers. They said they learnt about eclipses with the aid of a demonstration using a laptop. In a fairly large sized classroom, it would have been difficult for the children to see the demo on the laptop screen. Nevertheless, children seemed excited about the demo. Given a chance, their order of preference would be to learn using computers, TV and radio; computer being the most preferred tool. They remembered the radio lesson 'Who will bell the cat?'. They felt poems were taught better on the radio. They said they preferred TV to radio because they could 'see' things here. They supported their view by quoting that they learnt about the movement of tectonic plates and formation of continents by watching it on TV.

**3.2 Only Radio:**

**School 7**

**School:**

This school is located 18 kms from Bangalore. School has got a new building now. But due to road extension work, the new building is going to renovated again. Classrooms are very congested. Teaching aids are not displayed in the classrooms. Seating the students is an issue. School has only Radio programme. School has a TV but no Edusat. There are some educational VCD’s which the school has have purchased on its own. There is good support from SDMC members. Many donors have funded for the improvement of school building.
Teachers:

The HM was very cooperative and gave us all the information that was needed for our study. But teachers were not so. They were very hesitant to conduct a class for our observation. Many of the teachers were standing outside and chatting with other each during the classes. The teachers opined that radio programme was an extra work for them. Some teachers said because new building construction was going on and due to space problem they did not use radios.

Radio Lesson:

Lesson was ‘Our Festival’ for 7th Standard. Because we were there, they took children to the room where radio was kept. But as per our observation, it was clear that children are not getting any radio lessons from many months. Many of the students did not get pen, book or pencils to note down some of the questions posed during the lesson. The teacher also appeared disinterested. Subject teacher was not there with the students. The room was very congested. Children sat haphazardly and many were seen chatting among themselves.

Classroom Observation:

We observed a Kannada class for standard 4 students. There were 49 students in the class. All of there were seated on the floor in rows. We later came to know that a few children seated separately at the back were “slow learners”. During the course of her teaching, the teacher made no attempt to engage with these children. The teacher taught a poem rather mechanically. She explained it bereft of any emotion and made the children repeat the poem after her.

Students:

Students were articulate but not very well groomed. When asked about radio programs, they said they had not listened to it this academic year. They were not much interested about the lessons they had heard last year. Many of the students said it is very boring.
3.3 CAL and Radio

School 8

School:
This school is situated in the centre of the city. Since it is a model school, it gets good funds from donors and government. It is a very old school. School has big and neat classrooms. School has both CAL and Radio programmes. Strength of the students is less. This school has always had one or the other visitors. Thus, lot of the teachers’ time is diverted towards showcasing the school to the visitors. First day we didn’t get good response from Headmaster and a few teachers. Teachers were reluctant to show us their lesson plans.

Teachers:
The HM was not very cooperative. On the second day visit she did not allow us to observe the radio programs since some foreign visitors were visiting the school. She subsequently suggested an alternate date, after repeated requests. Two teachers were very articulate and discussed about the issues affecting ICT in school. Their grouse was that there were too many programmes and being the heart of the city, too many visitors. All teachers are computer literate.

Computer Class:
During our visit computers were not working and hence we could not observe the classes. But teachers are familiar with the CD’s that are used in the computer classes.

Radio:
The class was multigrade, because out of 5 teachers, 3 teachers were absent. We observed a Kannada lesson for 4th and 5th Standard children. The teacher handling the class was physically challenged. One student wrote all the points on the blackboard as the radio lesson progressed. Children sitting in the last benches were not participating at all.

Classroom Observation:
A multi grade class combining standards 4 and 5 was observed. There were 17 children in all and were seated in benches placed in rows. A Kannada prose lesson was being taught
in a very didactic manner. After reading out aloud and explaining the last portion of the lesson (the remaining had been taught earlier), the teacher made students write answer to questions given in the textbook. He did not go around the class checking children’s notebooks as they wrote nor was there much discussions on the ‘answers’.

**Students:**

The students are very active. Many of them are children of migrant workers. They will be in the school until their parents have the job in that particular area. Then they will move to another area or may be another city. They like attending school and like their teachers. Students like radio programs and computer classes. But prefer computers since it gives them visual effects.

**School 9**

**School:**

This is a well known school and in a interior village and over 140 km from Bangalore. The radio programmes are conducted regularly here. This school is one of the handpicked schools by EDC for piloting its radio programmes. It has been often visited by EDC sponsors from abroad. The school has one laptop and a computer which has been sponsored by individuals.

**Computer:**

The students from this school have very less exposure to computers. The school has two computers but with very few CD’s. The students are made to sit to watch the CD’s after school hours once a while.

**Radio Lesson:**

The school follows the regular timetable laid for radio programme. They have both tape recorder and radios in their school. The battery operated radio is kept as stand-by in order to make sure that even when there is no electricity the students don’t miss the radio
programme. Both the students and the teachers are quite happy about chukki china as they are activity based.

On the day of our visit, Kannada rhyme from class 6 text book was broadcast. The Kannada teacher was absent. The poem that was broadcast was not taught by the teacher previously. The substitute teacher helped the children with the radio class. The children and the teacher followed the instruction during the radio session. At the end of the session most of the children were able to sing the poem seeing their book along with the radio. They also answered most of the questions put forward to them.

As radio programmes were systematically followed in this school, children from 4th and 5th standards were not even told by the teacher even to sit in a circle. They promptly sat in a big circle and followed the instructions. They all sang the introductory song together and waited for the programme to start. The students themselves took turns to play the activities and there was no need for the teacher to prompt.

**Classroom observation:**

The HM taught the students of 6th standard an English poem on rain. The teacher read the poem twice and started explaining it. The students’ participation was good.

The Maths teacher involved everybody in the classroom. The students (most of them) were willing to come forward and solve the problems written on the board. Many students were well-versed with multiplication tables. The teacher had created maths resources with the help of matchboxes. The resources are designed to help students can derive their own formulas. The 7th standard students in this school carry a small pouch which has many geometrical shapes (square, triangle and rectangle). They use this kit to understand their algebra and geometry lessons better.

**Students:**

The students told us that they enjoy and look forward to the radio lessons especially Chukki Chinna. Few students were able to recollect some of the radio sessions that they enjoyed. The students believed each character in the radio is just like one of them. The way they spoke helped them imagine and dream about the things they talk about and that made it more interesting for these children.
None of the students found it difficult to follow math lessons on radio. They told us that after every math lesson was broadcast, the math teacher reinforces the problems and the concepts taught.

The only problem they face was that the questions asked at the end of the session were fast especially in English. This made it difficult for them to answer or copy it down.

**School 10**

School:

The school is on the main road and is within the vicinity of the city. Most of the students come from nearby slum areas. This school proved to be difficult to study as the HM did not co-operate with the researchers. He said that government schools have become open grounds for meaningless studies by NGOs. He questioned our credentials for conducting a study and when the Department has qualified people why should external people do the research? He complained a lot about the enhanced duties of teachers to disburse food and monitor students using the toilet etc. Even bringing students from their homes is a difficult task as teachers are trained to teach in the classroom and not mobilize students from homes and parks. He finds the parents irresponsible towards their wards and disrespectful towards teachers. He also mentioned that his experience with NGOs has been very negative as they write negative reports about the school. He spoke very rudely initially. He refused to allow us to conduct the study unless the school list with SSA’s approval is brought. We requested him to provide the school details and promised to return with the school list.

On our later visit, we showed the school list. He questioned us extensively and also checked all the formats to see what information is being collected before finally agreeing to let us go ahead with the study.

The HM is a high school teacher but has been posted as graduate HM. He said that he is entitled to independent powers to develop the school. He has been in the school for the past 4 years and has made the school as quality learning school. His students are also good in sports activities. The students get shoes, bags and books from donors every year.
There is also an Anganwadi centre in the same school mainly started as feeder centre to the school but the students join private schools later. The Nali Kali programme is going on well and is received well by students, parents and supervisors. The school conducts the assembly every day with thought for the day, news reading by students and talent shows. The school promotes newspaper reading after lunch every day in the classroom. The school also takes students of class 7 on excursion to different historical places.

**Teacher:**

The Interaction with teachers was good. There are 12 teachers including H.M. The teachers are not happy with too many programmes thrust on them. But, they are comfortable with the radio programme and appreciated Chinnara Chukki and Chukki Chinna very much. Teachers are not trained on computers.

**Computers:**

One of the first things the HM did was to take us to the computer centre and show the 5 multimedia computers given by IBM under KidSmart program. The computer room is used as library and activity room also. The program covers class 1 to 3 students. The entire class comes to the computer room and students use the computers in pairs. So while 10 students are using the 5 computers the others read books or do activities given by the teacher. The volunteer from Akshara Foundation doubles up as computer facilitator. The computers are pre-loaded with educational games and students enjoy playing these games.

**Radio lesson:**

The radio program is conducted regularly using 2 radios. Teachers in this school were happy with the radio program and demonstrated planned usage of the lesson. They were prepared for the lesson with instructions on the board, objectives written on the board, grouping of students and class management, readiness with material required to show, drawing on the board etc. It was evident from the students participation during the radio lesson, that they attend radio classes regularly.
The school has a TV and DVD player. The teachers mentioned that they used to show video films to the students in the big hall. However, the students said that they saw some 3 to 4 films on environment and animals, in English 2-3 years ago.

**Students:**

The informal interaction with the students during lunch break was very interesting as many students of different classes welcomed us and said that they like watching quiz programs of different TV channels. The class 3 students wanted us to come to their classroom and conduct quiz for them. This they said is the most challenging activity for them.

The students like doing all the activities in school. They said they enjoy radio and computer lessons. They felt that radio lessons provide a revision after their teacher has taught it. Twice a week they have computer period and they use all their free period as computer period. They like to play games and draw on computers. The students find computers as a visual aid for learning. However they find teachers’ way of teaching better as the teachers keep repeating in the class.

**School 11**

**School:**

This school is located in a compound that houses high school and PU college. The HM initially denied that computer training has been given to any of the teachers, including himself for reasons best known to him. Later, when we became aware that this school was identified for pilot studies by APF and that training had been given on basic computer skills, he said some rudimentary training was given.

**Computers:**

The school has 12 computers – 5 standalone PCs and a 3 in one model from APF and 4 from Akshara Foundation. Akshara Foundation’s volunteer visits the school twice a week to conduct library sessions along with computer sessions for students. The school has computer classes scheduled in the timetable and used to hold CAL sessions for all
students as long as the computer teacher was present. Starting this academic year they do not have a separate teacher and therefore, the HM is reluctant to send students to the computer lab with regular teachers. There are at least 4 trained teachers, including one teacher who underwent Intel’s 10 day Master trainer’s programme. The school has digital camera which was given by APF to help students develop on local content projects. Earlier, students had made projects on health survey etc. The school was chosen for many pilot studies for digital content such as EDC and Edusat films. Akshara Foundation has also given the school Maths material for pilot study.

A program called “Mahiti Tantra Gnana” was held where the students from the school were taken to another High school to explain how the technology has helped them progress in life.

Radio Lesson:

All the classrooms have speakers. Radio class was chaotic. Two sections were combined and there was no place for students to participate in any activities being suggested in the radio lesson. The teacher was feeling flustered as she had to organise the activity and at the same time take notes in her book and also write on the black board all at the same time. There was also no prior preparation and planning.

School 12

School:

The school looks very neat and spacious. There is a large play ground and a stage in the centre. The school building is painted with National leaders and suitable pictures for children. There are two buildings adjacent to each other. The school has compound wall and gate. The school was adopted by Rotary club and it has helped in school development and maintenance.

The headmistress is a keen presenter of the school. She took out school records to provide accurate data on school enrolment. She had very little knowledge regarding computers. She mentioned that there may be 5-6 CDs in the computers. She took out some audio
cassettes from her storage to show that they have audio cassettes on bhakti geete etc. The HM was keen to showcase the Nali Kali program.

The school has high class strength in classes 1 to 4 because of 2 sections (50 - 60 in each section). Classes 6 and 7, with almost 100 students in each class have only one section, due to shortage of teachers.

**Computer:**

The school has 5 computers. However, the UPS has not been working and nobody came to repair in spite of repeated complaints by the HM. Since the school does not have much power cuts during school hours, they have been able to connect the computers directly to the power supply and use them. The school has a computer class in the time table and students are taken to the computer lab regularly. Two teachers have been trained on using computers. But both are not confident at all and complained of inadequacy of the training. They were not fully aware of the extent of digital content available in the computers. Students spoke a lot about their school, friends, learning and computers, its parts and uses etc. Very little was said about the content and learning through computers.

**Radio Lesson:**

This school has 2 Radios with tape recorders. Radio programme was introduced before the year 2000. The time table for radio lesson is put on the wall so it’s easy for the teacher and children to prepare for Radio lesson.

The radio program appears to be going on well in the school. Rotary has donated speakers for every class room and the sound is clear. Teachers of classes 4 and 5 are able to integrate the activities recommended during the radio programs in their regular classroom teaching.

**Students:**

Interaction with students was good. They said they liked coming to school, they enjoy the activities on Radio, computer and know to use computer. They use Microsoft Word for writing names and short stories. They draw on paint brush. They play car games on computer. They said they can understand radio lessons better.
**School 13**

School:

This is a small school with students mainly from the local slums. It is located in centre of the city. Many students stay in hostels. They are very talkative and friendly. There is construction work going on at the back, mainly in the play ground. The senior teacher told us later that the Urdu school would be shifted to this premise shortly after the building is ready. This would mean that the children will no longer have a large play ground.

Teachers:

One of the teachers mentioned that there are many drop out students who have been brought back to this school after a long gap and they pose a lot of difficulty for the teachers. Many of them do not obey the teachers or even sit in one place. They do not do any writing work or respond to questions asked about lessons. Sometimes they even disturb the other regular students. Teachers also complained of their duty of bringing back students from homes when they absent themselves, especially as most parents are slum dwellers and they do not respect teachers. Some of them are drunk even during day time and address teachers rudely when they try to get the students to be sent to school.

The school has a visually impaired music teacher who appears dedicated. Many students of classes 3 to 5 were singing songs with interest. The Nali Kali program seems to go on very well. The teacher was also friendly and invited us especially to visit the Nali Kali room and observe the students.

Computer:

The school has 5 computers donated in 2009 by Akshara Foundation. The school has CD’s prepared by APF and Adamya Chetana. The librarian from Akshara Foundation conducts library class twice a week and also helps children use the computers. None of the teachers are trained.
Radio Lesson:

The school has one radio. On the day of our observation the radio lesson was on Mr. Vishweshwaraiah for class 6. We observed his session and noticed that he took notes as the radio lesson was heard, instructed the students to listen keeping their books open. His summary at the end was a synopsis of the lesson with notes on black board. He did not ask students any questions or ask them to write down from the black board.

Students:

The children come from the local slums and sometimes the teacher has to visit their homes and bring them to school. Some children come from a hostel. The interaction with students was good. They want to achieve something in life and help their parents whom they see struggling for their livelihood. The students were very sweet and cheerful. They said they enjoyed using computers and reading books. They appeared lukewarm to radio lessons. They demanded more time on computers.

School 14

School:

The school has strength of over 600 students. This school has CAL and Radio programmes. It has a dedicated computer room and a computer teacher to facilitate the CAL. The school campus has quite a big playground and cleanliness is maintained in the premises. Good arrangement is done for drinking water and other amenities. The surrounding environ is silent and conducive for learning.

But when it comes to ICT and innovations in teaching techniques, we observed that the implementation is not as much as it was said to be! Since the school is quite frequently visited for inspection, case studies etc, the teachers are used to providing standard answers. Though the teachers and management presented a picture of ICT being intensely pursued in their school, the truth is that it is employed as a showcase for visitors. Above all, lack of professional harmony / co-ordination among the staff is quite apparent.
**Teachers:**

As mentioned earlier the teachers tried to give a feeling that radio programmes and computers classes were a regular feature of their teaching. But through some probing we were able to ascertain that the answers given were actually manufactured.

**Computer:**

During our discussion with students and teachers we understood that the students were entering the computer class for the first time this year (elicited during students’ interview) and that teachers were not aware of any CD titles that they have used recently (*some were tentatively quoted from memory*). Even the CD titles played are rarely used as support for syllabus. The school has about 9 computers. The teachers were reluctant to give a demo computer class and we had to compel a subject teacher to do it. Finally the science teacher gave a class on ‘Digestive Organs’ for 6th standard students. During the class, we observed that there was very little student-teacher interaction. The computer teacher was playing a more proactive role by explaining the activity of identifying the digestive organs given in the educational CDs to the students. We also observed that a few computer skills like typing, drawing etc have been imparted to some students and that these students could confidently handle the computers. Useful charts related to computer operations have been displayed in the computer room.

**Radio:**

Even during our discussion with the teachers we felt that most of the things that were being said were from memory and not from actual implementation. This was further proven during our observation of the radio class for 6th standard students. The topic of the radio lesson was ‘simple fractions’. The teacher simply switched on the radio and went on writing the problems on the board! There was no interaction with the students and very little instruction given to students. On top of that, the sound clarity was poor. Students sitting in the last benches were not able to hear the lesson clearly. How ever a few students were showing interest in the class and were writing down the problems and singing energetically the math song broadcast in the radio. Earlier, the teachers had told us that they interchange classes, so that the subject teacher is present in the class during the radio programme. But the students negated this saying
that no such arrangement takes place and the teacher taking the class, during the radio programme, simply switches on the radio and sits. Also, they do not have an updated Radio programme timetable.

Students:

The students are well mannered. Children told us that radio and computer classes are being conducted but not regularly.

SDMC:

The SDMC President is said to be very supportive to school development. She has come back from abroad and has admitted her son in this government school. She has contributed funds from her own purse as well as found some local donors.

School 15

School:

This school has CAL and Radio programmes. It has no Edusat programme, though it has a TV that has not functioned from day one! It has a dedicated computer room with a computer teacher to facilitate the CAL. The school campus is small and cleanliness is non-existent. Water and other facilities are just about OK. The surrounding environ is noisy as it is located near a busy market. Theft of school property is quite frequent and after school hours the premises is reduced to a gambling den. Police complaint has been registered but nothing positive has come out of it. This school is said to have had a good reputation for ICT earlier but now some genuine issues are affecting its use. Some of the general issues observed are:

1. Teachers lack the technical expertise for ICT
2. Long term unavailability of power because of theft of wire and fuse
3. Staff shortage
4. Lack of security for school property. Miscreants create havoc here after school hours.
5. Lack of support by SDMC
**Teachers:**

The HM was non-cooperative in the beginning but slowly started supporting our study. The teachers cooperated from the beginning and discussed about the issues affecting ICT in school. But only a few teachers seemed to possess any knowledge of computers.

**Computer:**

We had discussion with a teacher, appointed temporarily by Paraspara Trust, which has donated 2 computers to this school. The computers are being used only for teaching English language (using ILID CD’s). 1st to 4th standard students do not use computers. About 45 students attend computer class at a time. Some of the children get the opportunity to Paint and operate educational CD’s themselves. Usually it is a single group watching the education CD in one computer that supports multimedia. The computer teacher says that there are not frequent power shutdowns but the theft of fuse is a major issue. Other subject teachers’ knowledge of computers is basically nil.

According to the computer teacher the students are quite confident about using computers and exhibit a high level of enthusiasm in learning through computers.

**Classroom observation:**

In the beginning, none of the teachers were willing to give a demonstration class. Finally, we had to prevail upon the HM to organize a class for observation. She taught a Kannada poem for 6th standard students. It was mere recitation of the poem, inciting no enthusiasm in the students. The teacher said that the radio lesson for this particular poem had already been broadcast a month ago and the children had heard the radio lesson.

**Students:**

The students like attending school and like their teachers. They show a keen interest in studying. They seem to have a good working knowledge of computers. They too are worried about the regular theft in school.

**SDMC:**

The SDMC may as well not exist for this school. But the local MLA has promised support.

SSA has recently sanctioned funds for renovating the school.
School 16

School:
The school is situated in the centre of the city. The school has two buildings which are diagonally opposite to each other. The buildings are very small and have four floors and it is a very congested environment overall. The school does not have any playground. Classrooms are very small and strength is more in every class. The headmaster's office had various kinds of charts about the activities in the school.

There are 4 radio cum tape recorders in the school. But still in some classes students have not listened to the radio programs from many days. Teachers are also not bothered about using the radio program. For instance, teachers and HM said that since past few days there has been no radio program because of the floods in North Karnataka. But we asked the teachers to switch on the radio at 11.30 and the program was being broadcast.

Teachers:
The HM was very cooperative and supported our study. One teacher knows to handle computers. Most of the teachers are not very keen in the radio programs. They say that it is not very applicable in their regular classes. They feel teacher is a passive observer during radio program.

Computer:
Computer room is in the third floor and there are 6 to 7 computers. But in this academic year they have not used the computers at all. Reason is that they don’t have any computer teacher in their school. And since higher primary classes are in the other building it takes them almost 20 minutes to come to the computer room. The period ends by the time they switch-on the system and start using the computer. And teachers say they can’t climb very often. The SDMC and some donors are supporting this school in many ways. They have assured to appoint a computer teacher to the school.

We took few 7th Standard children to the lab. We observed that children like to work in computers. They were very familiar with using mouse and keyboard. They have seen some CD’s and were familiar with using CDs.
Radio:
We observed a Kannada radio grammar lesson for 5th Standard. Program was good but teacher was very passive. She just went on writing on the board. She did not observe what children wrote on their books. Students did not get any instructions from teacher as to what was to be noted down. Radio program is going on in every class but not effectively. In most of the classes children listened to the radio program as a routine practice rather than attempting to understand the concept being dealt with.

Another radio lesson observation was done for 6th Standard. Subject was Mathematics and topic was ‘Algebraic Multiplication’. Though, the lesson has already been taught by their teacher, students didn’t know what variables are. Teacher was not at all prepared. Just wrote problems on the blackboard. And students wrote the same in their books. There was neither an introduction nor follow-up. There was no preparation before the program started.

Students:
The students are well mannered and but not neat and tidy. They are very active and very energetic. They like attending school and like their teachers. They seem to have a good working knowledge of computers. They like to work and use computers.

School 17
School:
This school has overall strength of 92 students. It has CAL and Radio programmes. The HM office trebles up as computer room and dining room for kids. A computer teacher facilitates CAL. The school is located on a narrow lane and has no playground. But good arrangement is done for drinking water and other amenities. The surrounding environment is a bit noisy as it is adjacent to a road. School space is cramped.

We were tentative in the beginning to take up this school for study as we were focussing on higher primary schools for the study. But the CRP insisted that this school is quite promising and requested us to take it up for case study. Our doubts were unfounded, as
the school, with its limited resources, has put in sincere efforts to make ICT an intrinsic part of the teaching process.

**Teachers:**

The HM and teachers were quite cooperative. We could gauge during the interviews that teachers were familiar using computers and that radio programme was being done regularly (this was further corroborated by the neat and detailed register of every radio lesson marked with the subject and topic date-wise and the students too mentioned the same programmes). Also we sensed no hesitancy or reluctance on the part of teachers to allow us to observe radio lesson or computer class.

**Computer class:**

The school has 4 computers though only 1 supports multimedia. First the students sit in a single group and the teacher explains the lesson and then 4 students were made to sit on each computer and watch the EVS lesson ‘Kaadinalli’ (in the forest). Children took turns to use the computer. The teacher interacted with the students actively and intervened only when required. Computer classes are conducted twice a week for each standard. All records of the classes, CDs used etc are neatly maintained.

**Radio lesson:**

Cricket commentary was being broadcast during the radio class.

**Classroom observation:**

The class on ‘Parts of the Human Body’ was done well. The students were enthusiastic and actively interacted in the class. The students were allowed to express their opinion in the class freely. The classroom is neatly maintained. The school in general has good teaching resources like charts, models created by students, teachers and some purchased from outside. Activities like song and dance were also done in the class to encourage participation in class.

**Students:**

The students are well mannered. Most of them come from very poor background. In fact one girl student (3rd std) was sent to work for some elderly couple from whom her parents
had taken some loan. The teachers had to visit the couple’s family and convince them to allow her to attend school in the morning and work for them after school hours. Not surprisingly, most students reveal that they enjoy being in school than at home. They were wearing neat uniform. They were quite enthusiastic in sharing their knowledge of CDs used and the radio lessons they enjoyed. We could also see that they were confident in using the computers independently with little support from their teacher.

**School 18**

**School:**

This school is situated in main road. It has a total strength of 475 students. Classrooms are a little cramped and noisy.

**Teachers:**

The teachers were not very co-operative during our interactions. They were all very hesitant for any discussions. Inspite of them having been given extensive training in using computers, they insisted on having a separate computer teacher for CAL.

**Computer:**

The computer learning programme was introduced in 2008. This school has 9 computers, out of which 8 are in working condition. The school does not posses any CD’s to be played on the computers.

**Radio:**

Not working

**Students:**

The students are happy to talk about the computers in their school. They have learnt to switch on/off and to paint. The students were proud to tell us that inspite of computer being introduced in 2008 they were able to learn painting.
**School 19**

**School:**

This school is situated in the centre of the city. Since it is a model school, the school gets good funds from donors and government. School has big and neat classrooms. School has both CAL and Radio programmes. They have TV but no Edusat programme. First day we talked to the teachers and Headmaster. School has one computer teacher. She comes daily from 9 am to 12.30 pm. The school has a resource centre.

**Teachers:**

The teachers cooperated from the beginning and discussed about the issues affecting ICT in school. Few teachers gave good response about radio and computer programs. Some teachers are familiar with the CD’s that are used in the computer classes. But teachers do not go to the computer class with their students. The computer teacher handles the students. But many teachers had some issues with the radio program like: monthly syllabus not corresponding with the radio programmes and pace of narration being too fast. Thus students either lose interest or forget the concepts. Language is another issue that the children are facing.

**Computer class:**

We went to the school repeatedly to observe the computer class. The HM was not available at school. He had taken the computer lab keys with him. Hence the classes were not conducted and we were unable to observe the class.

**Radio:**

Observed 6th Standard Social Science ‘Our National Symbols’ radio lesson. Since students knew many of the symbols it went on well. Teacher gave additional information to children.

**Students:**

The students are well mannered and neat. They are very active and very energetic. They like attending school and like their teachers. They like radio programs and computer classes. But prefer computers since it gives them visual effects.
School 20

School

This is a 77 year old school located in Bangalore city. The school has a large playground, is fairly maintained and classrooms are well ventilated. The school has a radio and the children have been listening to 'Keli Kali' since 2001. The school has a television in working condition and five computers with Internet connection. At the time of our visit the Internet was temporarily out of service.

Teachers

The teachers were quite articulate and were quite well versed with the various radio programmes. They feel that the 'Chinnara chukki' and 'Chukki Chinna' are good programmes with variety in language usage and interactive programming. Children enjoy these programmes as well. The programmes are most effective when they are relayed after the lessons are dealt with in the classroom.

On the other hand, teachers felt that 'Keli kali' programme is monotonous and hence usually fails to hold children's interest. Also inadequate time is given to follow instructions and children have difficulty in keeping up with the pace of the programme.

The school does not have Edusat. The television in the school is used to fill in for an absentee teacher. Children generally watch 'Animal Planet' programmes during their 'free' period.

Computer Class

All children are made to sit in front of the computer and watch whatever is happening on the screen. Teacher and a couple of selected students operate the computer. The teachers said APF cds are being used for demonstration. Children said they like to paint on computer but they did not seem to know much about computers or CDs. They also did not seem to be familiar in handling computers.

Radio Lesson

A lesson on 'Earth and Globe' for class 3 was observed. The Radio lesson was being aired after a huge gap because of exams which were followed by mid-term holidays. The
lesson was not taught in the class yet. The children were seated in rows which was not conducive for activities. There were 54 children and two teachers in the class. The leaders for each bench were identified prior to beginning of the programme. One of the teachers was participating and giving instructions to children. The children's participation during the programme was limited to the leaders. Rest of the children had very little to do other than singing songs. They took part in the singing whole heartedly.

**Classroom observation**

A 6\textsuperscript{th} standard Kannada class was observed. A poem on Dr. Ambedkar was recited. The teacher explained the meaning. The whole class recited the poem and later a few times individual students also recited. Teacher gave information about Dr. Ambedkar before the radio lesson. But during the lesson what they learnt in class was not linked.

**Students**

We interacted with a group of class VII students. The students said they come to school because they like their teachers. They were familiar with the Radio programmes but did not remember any of the lessons – not even songs. This may have been due to a long break in the broadcasting of Radio lessons. They faced difficulties in Mathematics and Science lessons because too many topics are covered at one go and at a fast pace. They had difficulty in English lessons because they are not able to follow the pronunciation. They were not able to remember any of the activities done during radio lessons. They also felt that they understand better when their classroom teacher teaches them.

**School 21**

**School:**

The school is situated in the centre of city. It is one of the well known aided school in that area. The school has a well maintained resource room. The school has a TV set. But they do not have a dish connection to view programmes.
Teachers:
The teachers were quite welcoming. They are proud of their computer room. The previous head mistress took a lot of initiative in improving the computer education in this school. Along with her students she did a presentation which was widely appreciated. Till her retirement she took charge of the computer education in this school. Most of the experienced teachers in spite of having a computer in their houses were not comfortable using or teaching computer basics to the children. The teachers accepted that only few teachers who knew something about the computers were of little help. The teachers strongly believed that they require a separate teacher to teach computers.

Radio:
The radio programme had been successful in this school initially. But now mid day meal and the radio programme timing clash with each other. As a result they have stopped listening to the radio programme.

The overall strength of this school has dropped many folds, over the last two years.

Students:
The students taught to write their names, few lines in English, to draw and paint on computers. Most of them are happy to use the computers. The computers divided among the students such that each group has one student who can guide others. The students were happy about the resource room where they have displayed many attractive materials.

School 22

School
This school is in a small town right on a highway, 60 KM away from Bangalore. The school is quite large with a huge playground. The school has a television and radio. But neither of them were working when we visited the school. The computers were installed one week prior to our visit. The head master was out and we were not able to see the computer lab, as he had the keys to the computer room.
Teachers

The teacher who handles Science and Maths spoke highly of technology. She is a B.Sc., B.Ed graduate and quite proficient with computers. She was of the opinion that children would understand concepts better if CDs were used in teaching. But, the school has still not started using computers. All the teachers unanimously felt that a computer teacher is absolutely necessary as they neither have the skill nor the time to handle computer classes. They were also quite certain that they needed computer training, but would not be willing to handle computer classes. When integration was mooted, they did not seem to appreciate the idea. They all strongly felt a separate computer teacher was an absolute necessity.

The school has a full-time music teacher. She teaches art and music to all children at school. A few interested children are taking classical music lessons from her after school hours at her house.

Radio Lesson:

The radio in the school was not available. A radio was borrowed from a teacher's house. But the teachers were not able to tune into the right wavelength. Almost half a period went waste trying to tune it. Children were made to write notes during the remaining period.

Classroom observation:

Nali Kali classroom with 30 children was well organised. Teacher does not believe in the nali-kali method, but appeared sincere in implementing the methodology in the classroom. The teacher knows children's background well and feels that she needs to have flexibility while dealing with children of that age. She feels it would be better if methodology and time-bound targets are not given to teach a group of young children.

A science lesson for class 7 was observed. The topic was 'Health and Fitness'. The teacher explained and stuck to the information given in the text book. A well prepared chart was used. Children were made to write answers on the black board. A student's question about haemophea was snubbed. Interaction happened only when the teacher asked questions.
One more Social Science lesson for class 6 was observed. There were 72 children in the class because 2 sections of class 6 were combined due to the shortage of teaching staff on that particular day. The topic dealt with was about agriculture. The teacher was making efforts to involving children through questions. But these questions were closed ended requiring children to say 'yes' or 'no' in chorus. Some of the examples given were out of children's context. A few children were attentive while the rest were quiet and completely disinterested.

**Students**

Students were well-groomed and a few were very confident during our interactions with them. All of them said they come to school to get educated. None of the class 7 girls knew to turn the computers on and off. The reason for this was that during the present year they have not used computers and the previous years only boys turned it on and off. Only 4 children said they were confident of using computers. None of them remembered names of any CDs they saw. They rememberd they saw the Cap Seller story in English. As far as the radio programme was concerned, children only remebered the programme about fractions. They said they listened to the activities first and did the activities later in the classroom. They were unaware of any TV programme. Class 6 children said they have not had any Radio lessons or computer classes during the present year.

**School 23**

**School:**

The school was established in the year 1936 and is near Bangalore city. The school is well renowned in this area. The school is proud that it has a large strength in spite of many low fee private school in the neighbourhood.

**Computers:**

The CAL programme in the school is divided into two categories.

- Education through computers for lower primary children (class 1 to 3)
- Smart class programme for higher primary classes
Computer classes for lower primary school children:

IBM had sponsored 6 computers with matching furniture and a printer to the school during 2006-07. All these computers are colourful and every attractive, which are in turn are quite appropriate for primary school children. Each of these computers are attached to speakers, head phones and UPS. All the required educational materials are loaded into the computers. The computer class had space for the following, as per IBM’s directive:

- Reading corner
- Craft corner
- Computer corner

The teachers were regularly trained by an IBM representative. They also visited the school every 3 to 4 months to assess and help the teachers with the required skills. Teachers were also given ideas for wall displays.

As the strength of the school is high the students were distributed among 3 corners of the class. If one group of children gets a turn to operate the computers, other children were grouped among craft and reading corner. Usually three children shared a computer. After every 15 minutes the other group would take its turn to play on the computer or to do craft or reading. This has helped the teachers as well as the students to maximize the time they had.

Content: Basic shapes, English alphabet, numbers, rhymes, games and loads of the activities are some of the contents provided by IBM

Project period: IBM had run the project for 2 years.

Maintenance: Support that had been provided by IBM during the project period was quite appreciable. Regular hardware maintenance record shows that regular checks were done and it was made sure that the computers were under working condition.

Till the beginning of January 2009, the classes were promptly conducted. Each primary classes got two sessions a week. Teachers had maintained regular records till January 2009.
Education through computers after IBM: After two year time frame IBM wanted the teachers to continue the programme themselves. The teachers did so till Jan 2009. Now, the computer room has been occupied to conduct regular classes. When we entered the class unannounced we saw the computers placed towards the corners of the classroom. They were neatly covered with clothes. Lots of cardboards were stacked on behind the computers. The electricity cable lining that connect the computers were broken and hanging from the wall. The room still has the timetable charts, reading and craft corners etc., but no one had been using these from January.

The reason provided by the school for not using the computers: Since the higher primary classes are conducted in the computer room, the primary students are not able to use the computers. The teachers found it difficult to shift the existing class room as they had no rooms available to conduct the regular classes. Initially when IBM gave them the computers they had enough rooms to conduct classes. Once the building had been occupied by the high school they have no vacant room in fact they have no place for primary school children. The classrooms are congested. As a result the computers are closed and the teacher says that virus had attacked the system due to lack of maintenance.

**Computer classes for higher primary school**

The Smart Class programme for higher primary classes is being run by Educomp and supported by Dell. It promises the use of technology in a meaningful way which in turn can transform the method of teaching and understanding of the students. Dell has sponsored five schools all over India to bring about quality education through Smart Class. This is the only government school in Karnataka which takes the pride in possesing this technology based classroom.

The Smart Classes are conducted in a spacious room built separately with the help of SDMC members out of SSA funds. SDMC had played an important role in bringing Smart Class programme to this school. The class is equipped with electronic interactive white boards, projection systems, speakers, printer PC’s and UPS.

Computer teachers have been appointed as part of this programme. Out of two one is a regular computer teacher and the other is a technical and so called support person to the
teacher who assist the teachers with smart class. The duration of this project is for a year (2009-10).

Content:

Smart Class as the name indicates is meant to improve the understanding of concepts for children. Educom has framed the content with the help of Discovery Education, desgnmate eureka, and crocodile clips. The contents are highly animated, with multimedia modules with 2 and 3 educational content.

The content ranges from kindergarten to higher secondary, covering subjects like English, EVS, Mathematics, Science, Economics, History Physics, Chemistry, Biology Geography, Economics and Business Studies. Educom had taken care to cover syllabus of all the boards ie, CBSE, ICSE and State. It becomes the responsibility of the teachers to select the required content according to their boards and requirement.

Smart Class and the role of teachers: Smart Class integrates technology in classroom teaching. Every teacher gets 14 days of training to understand its working. One main computer acts as a Knowledge Centre where it is equipped with all the digital content required. The teacher goes through the content and selects the required portion for her respective class. Then she has to create her file where all her contents are stored. All these has to be done before the class. Once she brings her class to the smart class she can project the content required with the audio or she can also mute it and explain herself.

In spite of making Smart Class training (12-14 sessions) compulsory not much interest is shown by the teachers. The Dell instructor for the Smart Class support teacher told us the training sessions differ as it is according to teachers’ available free time. None of the lower primary teachers have shown interest in visiting the Smart Class or getting themselves trained.

These teachers said they see no scope for primary school children as they have only rhymes, shapes, colours etc. The teachers believed that though interesting, the outcome would be less effective as the entire content was only in English.

Only one Social Science teacher had taken her 6th and 7th standard students twice on the days of our visit. She showed the children about the volcanoes, and earthquake. We
observed that with the help of the instructor she selected the content and asked him to play for her. The children were quite happy and actively questioned her on what they saw.

One of the science teacher tried to spend most of her free time studying the content. She uses the Smart Class regularly along with her 8th standard students. She is very happy with the content as it made it easier for the students to understand physics experiments and biology. She also felt the digestive system was well understood by her student with the help of visual images. She is very happy with the content.

Due to internal dynamics between the primary and high school the number of class allotted for the 6th, 7th are very less (twice a week) as per timetable, which is also not strictly followed. Whereas class 8 students get more time in the Smart Class.

**Radio Lesson:**

The teachers initially used their own radios to listen to the radio programme. But as the instruments were either robbed or damaged, they no longer buy them. They have been using a tape recorder provided by an NGO. As a result of a Department memo they had received the day before our visit, the school purchased a radio. A teacher took her students for the radio lesson. Due to lack of space and large strength, only half of the 3rd standard classes were able to occupy the classroom. 4th standard Kannada teacher also accompanied the students to make them listen the grammar that was to be taught.

Both the teachers were busy taking notes during the radio programme. They made little effort to teach the children and were concentrating on writing the notes. Only when they had activities they came forward to draw circles. The children however were following the instruction and understood on their own.

The major problem faced by the teachers were that the radio programme clashed with the lunch timings and they had to leave the children to have their food before the programme finished.

**Teachers:**

The teachers are willing to teach the students with these computers. They also told that the frame work provided were very useful and interesting. But non availability of space
has become a constraint to conduct computer classes. All the primary teachers collectively agreed that Nali Kali introduced in classes one and two makes it difficult to bring the present 1\textsuperscript{st} and 2\textsuperscript{nd} standard students even outside the classes and they also said even if IBM computers were revamped and available it would be a difficult task for them to teach these children through computers in spite of them knowing that it would be interesting.

**Students:**

The students were excited to talk about what they learnt from computers for the last two years. Two sets of students were interviewed.

The present 3\textsuperscript{rd} standard students had used these IBM computers for the last 2 years. They were happy to talk about the games and activity. They were happy to talk about numbers and alphabet they learned through the computers. They specifically told that they enjoyed reading drawing and playing in the computers during the same period. When spoken to 6\textsuperscript{th} standard students it was clear that they were able to distinguish between IBM computers that they had used in primary classes and the present computer classes. They told us that with IBM computers they had fun with games and activity and they had particularly enjoyed painting, drawing and typing. They were proud to say that they knew to handle computers very well.

Future plans: The HM and the teacher promised that they would make conscious effort to implement the programme again if provided with a separate class room for computers alone. They also mentioned that they have some amount available from IBM project with which they would try to repaid and maintain the computers. HM specified that paying electricity bills won’t be a problem as the SDMC members were willing to pay the bills.

When we contacted the CRP about the present status of these IBM computers, he had no answer but just had to say that they had no option but to close the IBM computers class and use it as a regular class room as it was difficult with high school functioning in the same building now.
School: 24

School:

This school is located in the middle of a busy market road. It has CAL and Radio programmes. It has no Edusat programme, but has a TV and a VCD player to display educational VCD’s to students. It does not have a separate computer room but the large HM office doubles up as a computer room. They have a computer teacher to facilitate CAL. The school campus is moderately big and also houses the high school. Cleanliness is maintained throughout the premises. There is a shortage of rooms, so some classrooms are crowded. Facilities for water and food are maintained well. Though the school is situated right in the middle of the market it is not that affected by the noise because it has a high compound. The school functions efficiently with the limited resources available.

Teachers:

The CRP, HM and teachers were very cooperative throughout. Though most of the teachers we interacted appeared committed, a couple of teachers were highly efficient and talented. I found the teachers to take a personal care about the students. Teacher created resources were displayed in classrooms.

Radio lesson:

The radio lesson on the day of observation was ‘My Tree’ – an English poem. The radio lesson was being broadcast after the poem was taught in the classroom. So it was easy for the students to understand the poem and the hard words. The intervention by the teacher was very good, with complete participation by the students. The lesson was clearly heard by everyone in the class.

Computer class:

Though the computer classes are conducted in the office of Head Mistress, there is sufficient space to seat the students on the floor. A couple of rooms have been taken for administrative purposes & hence this arrangement. The topic chosen for the class was ‘God is great!’ It was a single group of 40 students with the teachers explaining the lesson with the help of an educational CD. The teacher nice linked this lesson to the ‘My
Tree’ poem that she had taught the day before through the radio lesson. The result was excellent with the students relating to the lesson closely & expressing their ideas on the topic. After the lesson multiple choice question were displayed on the screen & all the children were eager to answer the questions. Though hands on experience of the students could not be verified, it does seem that they have experience in using computers.

**Classroom observation:**

The HM conducted a class on Decimals for 7th std students. The classroom was not clean & dust seemed to be piled in the corner of the room. The roof was leak proof & floors seepage-free. A few teacher–created visuals are displayed in the class. The interaction between the teacher & students was good with the teacher inviting students to express their own method of solving the problems. But it was observed that the students were encouraged to do problems orally than be written down & worked out. The participation of the students was complete & they were enjoying solving the problems. The HM stated that this lesson will serve as the foundation for the radio lesson on the same topic that would be broadcast in the next week.

**Students:**

We observed that a majority of students from this school come from minority community. Generally, the students are well mannered but not tidy. They love their teachers and like attending school. Discipline in general is good and the interest in studies and extra curricular activities is high.

**3.4 Generalisation of case studies**

In the schools having provision of all three technologies – computers, radio and television (Edusat) there were no attempts to integrate all three technologies cohesively. The focus of integration as mentioned in Chapter 2 is on how teachers make use of different pedagogic resources, including ICT resources, within the given syllabus to design meaningful activities. In the case of radio and TV lessons, they are drawn exclusively from the syllabus prescribed by the Karnataka State Board.
In the case of CDs developed by APF (which were the ones almost exclusively used in our sample), one-to-one mapping with the syllabus was not there. Teachers had to identify content suitable to the class they are teaching from the CD. A majority of teachers reported that they find it difficult to do so and wanted class-wise/subject-wise CDs. This kind of attitude would further preclude integration even in the future. Teachers were nowhere oriented to do so.

Barring three schools, radio and Edusat lessons and CAL programme were functional in the remaining schools. In one school, there appeared to be good team work among teachers and have systematically followed the instructions accompanying each programme. They orient the students before a programme and summarise at the end of the programme. The teachers have also viewed all CD’s provided by APF, related to their subject and have found some topics useful for their own reference.

In another school, the headmaster said he obtained ideas from radio programme and APF CD’s to create TLMs. He has obtained quite a few awards at different forums for his TLMs. However, his penchant for creating TLMs did not seem to match their usage in his classrooms.

In the school that has only radio, the radio was dysfunctional at the time of our visit. Teachers did not see any value in the radio lessons. Even when the radio was working, the lessons were conducted perfunctorily. The remaining schools had both computer and radio. In seven of these schools integration was being attempted at various levels.

In two schools radio was not working and the HM informed us that it was beyond repair. Two other schools did not have a radio at all. One school complained of their radio being stolen. CAL programme was not functional in four schools at the time of our visit.

Teachers in all the seven schools where integration was attempted have been following instructions given during radio lessons diligently. Follow-up on both CAL and radio lessons are being done in these schools. At least three or more teachers in each of these schools are computer literate, though not all of them are confident in handling computers. Except in three schools, a majority of children in all other schools have picked up skills in handling.
General trends discerned from the case studies are:

- Students view computer as a tool for playing games
- Where teacher takes interest in conducting radio lessons, students find radio more useful
- Radio lessons for class 3 to 5 have helped children gain conceptual clarity, especially in Mathematics
- Teachers’ acceptance of radio is greater than other technologies
- While teachers see value in computers as resources, more than half of them do not feel confident enough to handle computers.
- Ten schools of the 24 we studied has a support teacher. Out of these, in three schools the SDMC had appointed them and in the remaining schools they were appointed by an NGO. Barring two, where subject teachers had also involved themselves there was no attempt at integration
- In nearly all the schools where integration was attempted, the HM was co-operative and a good team player
Display of Teaching Aids

GHPS, Banjarpalya
Dates of Visit: 16th Nov, 31st Oct & 1st Dec’09

GKMBS, Chamarajpet
Dates of Visit: 9th, 10th & 11th Nov’09

Edusat

GHPS, Nagavara, Channapatna
Date of Visit: 11th Dec ’09

GMPS, Gottigere
Dates of Visit: 29th Oct’09 & 12th Nov’09

Radio programme
Interaction with Teachers and Students

GHPS, Bytarayanapura
Dates of Visit: 16th 17th & 18th Nov ’09

GHPS, Dalimba.
Dates of Visit: 20th & 30th Nov’09

Classroom Teaching:

GMPS, Attikuppe
Dates of Visit: 16th, 25th & 26th Nov’09
4 Data Analysis

4.1: Consolidation

The quantitative data collected for the study in terms of school details/ basic availability of ICT related resources; teachers response to the questionnaire; and consolidation of class observations are given in this section.

School Details:

In our sample of 24 schools, the percentage of schools equipped with technology that are in working condition is given in graph 4.1.

**Graph 4.1 Percentage of schools having Radio, Tape-Recorder, Television and Computers in working condition**

Among the schools equipped with computers, Graph 4.2 gives details of availability of additional resources.

**Graph 4.2 No. of schools equipped with Educational CD, Internet connections and Backup power**
6 of the 22 schools had Internet connection; two-thirds of them were equipped with educational CD’s (majority of them were APF created) and half of them had back-up power. Interestingly, 75% of the schools reported having power supply for more than four hours on an average, as seen in graph 4.3.

**Graph 4.3 Availability of Power on an average school-day**
(as % of Sample Schools)

Four of the 22 sample schools having computers had a thin client server. The rest were equipped with stand alone servers.

**Graph 4.4 Nature of Server at sample schools**
(as % of Sample Schools)

Three schools with CAL programme had a separate computer instructor.
 Teachers’ details

Our sample comprised of 68 teachers, 50 of whom were females. The total mean age of teachers was 42.

Teachers’ general and professional qualification is given in the following figures

**Graph 4.6 General qualification of teachers**

**Graph 4.7 Professional qualification of teachers**

Nearly half of the teachers we interviewed (32 of the 68) said they have a working knowledge of computers.
Graph 4.8  % of teachers with working knowledge of computers

Among these 32, 26 of them have computers in their house and 13 of these 26 have Internet connection.

Teachers were asked if they found any lacunae in the content covered by prescribed textbooks. Only 29 of them said they did.

Graph 4.9  % of teachers who found lacunae in textbooks

When asked to rank their choice for various resources, this is what they reported.
They were given this exercise to indirectly ascertain teachers’ level of comfort about using various resources for their personal reference. Radio tops the list and television is at the bottom.

Teachers were asked to rate their preference for using different resources for teaching. These are enumerated below.

**Graph 4.11 Teachers who prefer resources - Books and Newspapers**
A majority of teachers who reported preference for radio as a resource for reference have found the English lessons under Chinnara Chukki and Chukki Chinna especially useful. Many of them also said the activities suggested in these two programmes are interesting.

Books appear to be the most preferred resource. We had deliberately not specified the nature of books in our questionnaire. When queried, they said they prefer textbooks. Teachers’ rating of ICT-related resources for classroom teaching is interesting. Among TV, computer and radio, computer garnered a greater rating as the most preferred resource. On the other end of the scale, more number of teachers have indicated they do not prefer TV at all. Within computer, eight teachers have said they prefer CD most while a greater proportion have indicated they do not prefer Internet at all.
Through our interactions with teachers, we ascertained that they are not familiar with the Internet. Popular media reports also seem to have prejudiced them again this media. Very few teachers appear to value the Edusat programme.

Greater probing is needed to understand these preferences.

**Observation of Computer Class**

Of the 24 schools we studied, 22 of them had computers. CAL programme was operational in 18 of them, at the time of the study. Two classes have been allotted for computers for each class per week in the time table in most schools (vide: Appendix 3). Observation of a computer class in these 18 schools are presented here.

**Graph 4.14 Proportion of students in class who can operate computer**

In 5 schools all children were able to operate the computer independently. In 5 schools more than 75% of the students could handle the computer on their own. In 8 schools less than 40% of students were able to operate the computer.

Our researchers observed that the level of interaction between the teacher and students in the computer class was about average, i.e, teacher did not go beyond technicalities of viewing CD’s.
By contrast, level of participation by students was quite good. This was gauged by the interest shown by students in using the computer, and engagement with the activities on computer. In 10 schools, all children were actively participating. In the remaining 8 schools, while few children were operating, the others were content to watch.

Researchers also documented if teachers intervened when students had problems either in proceeding with the activities or with conceptual understanding. In only one school did teacher actively go around the class and intervene when she perceived children were facing conceptual difficulties while doing the activities. In 7 schools teacher intervened when there was a technical problem or when children could not follow the instructions to proceed with the activity.
Only in 2 schools did the teacher review and summarise the activities done by children on computers.

**Graph 4.18 No. of schools where teachers reviewed and summarised computer lessons**

Observation of Radio Lesson

16 of the 24 schools in our sample had at least one radio in working condition. Radio programme of course, is extended to all schools across the State. Radio lessons are broadcast for different grade levels at previously specified time which is notified to the schools at the beginning of the academic year (vide Appendix 4).

Where possible, our researchers observed a radio lesson for a lower primary class and a higher primary class. A total of 23 radio lessons were observed. Half of the radio lessons that were observed were based on content that children had already learnt.
Graph 4.19  Stage at which radio lesson was broadcast

The level of interest and participation of students during the radio lesson is about average. A majority of the 40% of the students who showed interest and were actively participating in the radio class, were from lower primary class.

Graph 4.20  Level of interest and participation by students

In 5 schools where we observed radio lessons, there was good interaction between the concerned teacher and students.
Only in 3 classes were children seated in a group during radio lessons.

In two-thirds of the classes observed, teachers were not following the instructions accompanying the radio lessons.

Teachers were passive in a majority of the radio classes we had observed.
In 4 radio classes did teacher manage their time effectively during radio lessons in terms of transition from one activity to another; distribution of materials for activities, if any; and helping children with the activity, if need be.

In one-third of the classes, teacher summarized the radio lesson for the children.
Observation of Edusat Lesson

We were able to observe 6 schools having Edusat programme. Like the radio programme, the Edusat programmes are also broadcast at fixed time for different classes and subjects. These timings are intimated to schools beforehand and hence factored into the school time table (vide: Appendix 5)

In a majority of the TV lessons observed, the content had been covered by the teacher, during classroom teaching, as can be seen in the graph below.

Graph 4.27 Stage at which TV lesson was broadcast
(as % of schools with Edusat)

In 2 of the 6 schools where Edusat programme is operational, the TV screen was not visible to all students.
Graph 4.28 % of schools where TV screen was visible to all students

Classroom teaching observation

Researchers observed at least one lower primary class and one upper primary class, preferably of the same teacher who had conducted computer/radio/TV lessons. A total of 41 regular classroom teaching were observed.

A majority of the classrooms are reasonably conducive to learning as the following graph shows.

Graph 4.29 Classroom Environment of schools

In a majority of classrooms, included lower primary classes, children were seated in rows.
The following graph gives further indication of how teachers manage their classrooms.

**Graph 4.31 Classroom management by teachers**

In 90% of the classrooms, children were seated in one place throughout the class. 12 of the 41 teachers whose classes we observed went around checking students’ notebooks when written work was given. Half the teachers expect complete silence in the classroom and only 5 teachers spent at least a little time with slow learners.
Teachers either made the students write most of the time or not at all during one period of 40 minutes.

Drill and practice and written/oral repetitive work are the predominant techniques used by the teachers.

As to the use of resources, textbooks and blackboard find favour with a majority of teachers followed by charts.
4.2: Levels of ICT use by teachers

Initially, at the time of conceptualizing the study, we had planned to identify the levels to which teachers integrate ICT in their classrooms. As we did not find a single instance of integration as defined for this study (vide, chapter 2), we mapped their levels of use instead.

The UNESCO Report (2002) on *ICT in Teacher Education* has defined levels of ICT use by teachers as:

0 - Non – use : Not involved with ICTs
1 - Orientation : Begins to find out about ICTs
2 - Preparation : Gets ready to use ICTs
3 - Mechanical : Focuses on rote aspects of ICTs
4 - Routine: Uses ICTs in a basic way
5 - Refinement : Considers changes in use of ICTs
6 - Integration : Works in collaboration with colleagues to create interactive and meaningful classroom experience and find ways to use ICTs in subject-based teaching/learning
7 - Renewal : Considers improvements and innovations in use of ICTs
Based on teachers’ response to the questionnaire and interviews; as well as our classroom observations; teachers would fall between levels 1 and 4.

**Graph 4.35 Level of ICT use by teachers**

The rationale for this categorization is given below:

**Table 4.1 Basis for Categorising teachers vis-à-vis levels of ICT use**

<table>
<thead>
<tr>
<th>Level</th>
<th>Explanation</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Begins to find out about ICTs</td>
<td>• Does not know to operate computer&lt;br&gt;• Somewhat prefers ICT-related resources&lt;br&gt;• Perfunctory participation in ICT based classes</td>
</tr>
<tr>
<td>2</td>
<td>Gets ready to use ICTs</td>
<td>• Knows to handle computers&lt;br&gt;• Prefers to use ICT-related resources&lt;br&gt;• Interacts with children once in a while during ICT based classes</td>
</tr>
<tr>
<td>3</td>
<td>Focuses on rote aspects of ICTs</td>
<td>• Familiar with basic computer operation&lt;br&gt;• Prefers ICT-related resources and occasionally uses them for reference&lt;br&gt;• Follows basic instructions given in ICT-based lessons&lt;br&gt;• Summarises in a mechanical manner at the end of lesson</td>
</tr>
<tr>
<td>4</td>
<td>Uses ICT in a basic way</td>
<td>• Comfortably uses computers&lt;br&gt;• Prefers ICT-related resources most and periodically refers them&lt;br&gt;• Orient children before ICT-based lessons; provides guidance and questions once in a while during the lessons; summarises at the end of the lesson</td>
</tr>
</tbody>
</table>
The following section lists the strategies used by teacher in level 3 and level 4 while handling ICT-based classes.

4.3: Strategies adopted by teachers

There was no evidence of transfer of learning across the three technologies nor was there a conscious effort on the part of the teachers to relate radio/edusat/computer lessons. Hence, our observations of what teachers did in each of the three classes are listed separately.

Radio class

- Prior preparation in terms of arranging for necessary materials
- Orienting students before the lesson
- Following instructions given during the course of the lesson
- Guiding children once a while, if they have difficulty in doing the activities instructed
- Summarising at the end of the lesson

Computer class

- Questioning children while viewing CD’s
- Guidance provided in the form of instructions
- Interacting with children once in a while

Edusat class

- Asking a few questions to help children recall some of the facts conveyed in the lesson
- Briefly summarizing what was broadcast

4.4 Ways in which children learn

Children are of course curious and open to learning through different means. Some of the ways in which they are learning through radio, computers and television as discerned through our classroom observations and interactions with children are listed below:
Through Radio lessons:

- Children are able to gather information
- Variety of examples provided is useful
- Additionally, children of classes 1 to 4 are able to imagine the characters and scenario and identify with characters
- Children enjoy the activities if teachers make children do these activities in the course of the lesson
- English lessons for higher classes are too fast for children to follow
- Recall and retention of previous radio lessons is not good. Children were only able to reproduce title songs

Through Computer lessons:

- Computers help children in visualisation
- Where teachers summarise/reinforce after lesson was taught, children have retained what they saw
- Learning has improved among slow learners
- Peer learning happens
- Children have learnt English better
- Children find computers useful to link what they view with what they hear in radio where same lesson is repeated (for eg: Fractions in mathematics)
- Exposure has improved their confidence
- Children enjoy using computers

Through Edusat lessons:

- Mostly passive and silent viewing
- In schools where teacher asked questions (factual recall) children answered in chorus
- Children enjoy English lessons and watch with rapt attention
- Visualisation has helped in a few cases (for eg: Historical places in Karnataka)
4.5: Perception of Stakeholders

We interviewed teachers and engaged children in discussions to ascertain their views on the ICT programmes

Teachers’ Perception

- There are too many activities for us
- We are given too little freedom
- Multiple programmes are launched in same school by NGOs. These programmes fizzle out after a year
- ICT is an additional burden
- Computer training is inadequate
- No follow-up/ refresher programme for computers
- We are afraid of using computer, in case we spoil them
- Where staff strength is low, ICT is affected
- Mismatch in time-table given and lessons broadcast
- When HM is non co-operative, there is very little we can do
- Audio problem occurs many a time during radio broadcast
- Listening comprehension is poor among students. Hence radio lessons are not very effective
- Radio lessons for higher classes are too packed in terms of content

Children’s Perception

Our researchers interacted with randomly selected children from a lower primary class and from an upper primary class separately. We found them articulate and in most cases expressed themselves freely as we ensured their teachers were not present.

- Children from lower primary classes seem to prefer radio, computer and Edusat lessons equally. However, a majority of higher primary class students told us they find radio lessons boring.

- Children articulated the following problems in radio lessons:
  - Pace is too fast
• Sound is not clear
• Following English is difficult
• Noise from outside or neighbouring classrooms is disturbing
• The major difficulties that children find in using computers are frequent breaking down of systems and limited number of systems available for use
• Almost all boys play computer games. A sizable number of them go to browsing centres to play games
• In the schools with CAL programme, children have learnt to use “Paint”. Only in five schools do they view CD’s
• Children like interactive CD’s rather than passively watching video’s/CD’s
• They enjoy English rhymes on CDs
• All children having Edusat said they find TV lessons interesting. They found the visuals appealing. None of them find any problems while viewing TV lessons. Interestingly, even in the two schools where we found the TV screen not visible clearly to all children. The same children who complained of noise creating disturbance while listening to the radio, did not find it so while viewing TV.
• A few children felt they understand English on TV better than radio or computer

When asked if they prefer technology to their teacher only three students said “Yes”. The reason given by these three students: Technology–based lessons are more interesting; Technologies do not beat them like their teachers sometimes do!

The others felt they can clarify their doubts from teachers; they get better guidance from teachers; teachers talk slowly and they can follow them better; they learn values from their teacher.

A personnel from the organisation that creates ICT-based content was interviewed. The gist of the interview is reported below:

Frame work for content development:

Audience (teachers and students) research across Karnataka was done to find the difficult aspects of various subjects for both teachers and the students. On the basis of this survey,
the teachers were hand picked from various districts of Karnataka and were asked to specify the most imperative concepts and content to be developed. These contents then are framed to be the basic structure for their programme.

*Script writing*

Teachers from various districts undergo a training programme (for 10 days) wherein the master plan is explained to them. They are also given the framework within which they have to write the script. All these teachers teach state board curriculum. The content development team then ensures that the script is within the structural requirements.

*Formal evaluation of the programme:*

Once the script is ready and approved by the organisation’s members they are recorded for 35 minutes. These recorded programmes are first piloted in six schools to ascertain the students’ and teachers’ reaction. They then edit the programme as per the requirement and the programme gets ready to be telecast.

Every year a formal evaluation is done by a pedagogue and analysed by a research team. The final evaluation gets its approval from a technological expert from MIT, USA.

*Language*

In order to avoid the problems faced by various regional slangs and dialects in Kannada while broadcasting the programme, they follow cinema Kannada as it has been widely accepted.

The next chapter delineates some of the issues thrown up by this study and probable suggestions to address them.
5 Conclusion

"Unless we know where we are going, there is not much comfort in being assured that we are on the way and travelling fast” – Boyde Bode

5.1: Consolidated Findings

A consolidation of data is given in the previous chapter. In this section, findings pertaining to the use of computers, radio and Edusat are given.

Use of computers

- In 44% of school studied, only a few students could operate computers
- Level of interaction between teacher and students was either poor or average
- In 94% of schools, level of teacher intervention was either poor are average
- Teachers did not review or summarize after computer class in four – fifth of the schools

Use of radio

- 54% of the radio lessons were broadcast after the teacher taught the same in class
- A majority of children in the lower primary class were active during radio lessons in 5 of the 23 lessons observed, the level of interaction between teacher and students was good
- Only in 3 classes were children seated in a group during radio lesson
- In two-thirds of the classes observed, teachers were not following the instructions accompanying the radio lessons
- Teachers were passive in a majority of the radio classes we had observed
- In 4 classes did teacher manage their time effectively during radio lessons in terms of transition from one activity to another; distribution of materials for activities, if any; and helping children with the activity, if need be
- In one-third of classes, teacher summarised the radio lesson for the children
Use of Edusat

- In a majority of the TV lessons observed (more than 80%), the content had been covered by the teacher during classroom teaching
- In two of the six schools where Edusat programme is operational, the TV screen was not visual all the children

5.2 Issues and Concerns

Some of the recurrent issues culled out from the previous two chapters are listed here.

- Teachers are unable to visualize integration because of the top-down approach adopted
- Management of class and time is a problem for many teachers, especially where class size is large
- Summarisation is for most part mechanical
- There is little scope to encourage thinking/ reflection among children
- There is no scope for teachers to adapt ICT to suit their classroom requirements
- Teachers generally view radio/CAL/Edusat as programmes and not as resources
- Teachers are feeling overwhelmed with too many programmes
- For higher classes radio lessons are only an extension of traditional teaching
- There is better acceptance and usage of radio by teachers probably because they are an extension of their traditional lesson
- Recall and retention by children of radio lessons is not good. Children are only able to reproduce title songs
- Whenever one-day international or T-20 cricket matches are going on, radio programme are not broadcast
- There is a mismatch between school programme and programmes that are broadcast (both TV and radio)
- Both Children and teacher are focused on taking notes diligently during radio and TV programme in most schools
- Edusat lessons do not adequately harness the power of the visual medium
- Not many teachers are comfortable handling computers
- Where staff strength is low, ICT programme is affected
- Training and orientation for teachers in computers is inadequate
The issues point to a pedagogical pattern that reflects an authoritarian, didactic approach to classroom teaching, largely due to the way ICT use has been conceptualized.

As the position paper of the National Focus Group on Educational Technology points out technology should make education dynamic and responsive to children (NCERT, 2005). This is clearly not the case in the schools we studied. ICT programmes appear to augment and reinforce teachers’ pedagogical beliefs rather than challenge them.

The second point of concern relates to teacher training or the lack of it. Finding optimal ways to use technology for students will take time, exploration and experimentation on the part of teachers. They are simply not getting the time or wherewithal for this. Training programmes need to veer around practical and pedagogical issues instead of only ICT applications. These programmes have to encourage teachers to reflect on and make decisions about ICT use. Training must adapt to teachers needs if we expect them in turn to adapt to their students’ needs. Also, teachers need to be empowered to recreate content, collaboratively.

This point leads to the third concern namely, the centralised nature of planning and implementation of ICT programmes.

An attempt has been made to address these concerns. But the last one namely, centralisation would preclude specific suggestions. A generic framework for pedagogy and training is outlined below. Wide-ranging consultations and discussions with stakeholders are needed to evolve locale-specific solutions.

### 5.3 ICT enabled Pedagogy

The starting point for technological innovation must always be goals and requirements of pedagogy. The primary aspects of media pedagogy namely its dynamism and non-linearity need to be harnessed to cater to constructivist pedagogy, expected of today’s teachers. Research and experience show that it is through interaction with other people, ideas and new experiences that we all construct new knowledge.

Some of the ways in which content delivered through ICT can help children construct knowledge is by:
• Including instructions and giving opportunities for children to discuss/reflect/think/reason out
• Tapping the networking opportunity provided by computers to help children learn collaboratively
• Providing more activities/projects making use of local environment
• Evolving strategies with the help of teachers, subject experts, pedagogues and content developers, to identify where in the curriculum ICT is best used
• Identifying how to effectively integrate ICT into different pedagogical environments

Research on ICT and Pedagogy provide pointers to pedagogical frameworks for integrating ICT into teaching/learning (Becta, 2008):

• Understand relation between a range of ICT resources and concepts, processes and skills in each subject
• Use ICT resources in challenging students’ thinking and extending their learning in a subject
• Prepare and plan lessons using ICT
• Recognize kinds of class organisation for effective ICT use

It is essential that teachers are given freedom to choose technology suitable to topics and their children, after training them to become discernible.

A suggestive teacher training module is discussed in the next section.

5.4 Probable Training Module

A review of literature suggests three models of integrating ICT into classrooms within a constructivist framework:

1. Integrating an interesting ICT application into existing instruction for the teacher
2. Providing teacher access to complete and comprehensive multimedia curriculum wherein the teacher selects and sequences those she wants to use
3. Helping the teacher construct a unit around a theme or topic using a variety of resources
For any of these three models, a *sine qua non* is at least a basic computer literacy for teachers. Also, their capacities to analyse the syllabus, understand the pedagogical implications of different ICT resources and manage these resources to suit their students, have to be built through adequate training. While keeping in mind these capacities, we adopted the third model in designing the training module. This module has been piloted by RV VSEI Resource Centre (a joint collaboration of RVEC and VSEI) for over 150 Government school teachers and 40 student teachers. The twin objectives of this ICT training programme were to equip teachers with basic computer literacy and to help them select and organize ICT resources in their classroom teaching. Accordingly, the five-day workshop included the following activities:

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Skills</th>
<th>Content</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Typing</td>
<td>Word Processor; Kannada Font</td>
<td>Creating unit plans</td>
</tr>
<tr>
<td>2</td>
<td>Integrating</td>
<td>A variety of educational CDs and videos</td>
<td>Evaluating, selecting and organizing suitable resources to teach the unit</td>
</tr>
<tr>
<td>3</td>
<td>Presenting</td>
<td>Presentation software</td>
<td>Preparing a presentation for the unit selected and giving a demo lesson</td>
</tr>
<tr>
<td>4</td>
<td>Maintaining records</td>
<td>Spreadsheet and Word Processor</td>
<td>Initiating the process of creating question bank; using spreadsheet to enter students’ records and analyse students’ marks</td>
</tr>
</tbody>
</table>

All sessions involved extensive discussions and reflections. It was impressed upon the teachers that there is no absolute best way of using ICT in teaching/learning. It was for them to evolve ways, think and reflect upon them and share them with other practitioners. To help with this, we have mooted forming local networks and seeking continued support from the resource centre.

*A probable model plan for ICT training for teachers*

Based on this study and our training experience, a model plan is suggested.

The duration of the training can be five days, followed by one-day follow-up sessions every quarter, for about a year. The training can include the following components:
• Curriculum

Teachers are largely unaware of the underlying curriculum that informs their syllabus, based on which textbooks are written. Teachers have easy access only to the latter. But it is important to make them aware of curricular principles and concerns. Hence, an ICT training programme for teachers must also include a session on NCF, 2005.

• Syllabus

Within the curriculum, teachers can situate their syllabus and be provided opportunities to critique the same. This exercise is necessary if teachers are to adapt constructivist principles in their classrooms.

• Classroom processes

Constructivism calls for doing away with rigid syllabi and having a flexible planning to cater to students’ needs. Teachers need more autonomy and to that extent extensive hand holding to help them design activities suitable for their individual classes. This is where ICT-related resources can play an important role, provided teachers are trained adequately.

Radio and TV lessons are by nature (as of now) not very interactive. However, EDC has attempted to bring out interactive radio programmes for classes 1 to 4, which are being uniformly enjoyed by children. By including pause time for grouping, arranging resources etc., these programmes have made provisions for a degree of interactivity. Nevertheless, the centralized nature of planning (wherein only a few teachers are involved in creating scripts etc.,) and broadcast do not offer much flexibility for a classroom teacher. But given the popularity and the effective usage of radio lessons, one way to bring in more flexibility would be to offer recorded lessons to schools. This would also help offset other logistics-related problems teachers reported during our study.

The training programme can include a session to help teachers plan as to when during the course of their teaching a particular topic, they can use the recorded lessons. This session can also include discussions on adapting the activities
suggested in these lessons for other topics/subjects. To empower teachers, their suggestions can be solicited to improve the quality of these lessons.

Coming to computers, they can be rather powerful tools in designing flexible classroom activities. A few are suggested below as probable pointers:

**Using Word Processor**

- Displays - Writing about inventions/discoveries
- Laboratory Reports - Enumerating problem solving methods
- Describing events - Preparing tables and graphs
- Writing biographies - Summary
- Producing creative written presentations - Submitting home assignments

**Using CD ROMs**

- Getting additional information - Simulated activities
- Research to prepare reports - Observing computer models
- Reinforce hands-on activities - Interactive games
- Illustrations - Data retrieval
- Locating resources/references - Project work
- Supplementary assignments

**Using the Internet**

- Accessing and retrieving information - Join discussions on bulletin boards or newsgroups
- Updating information - Collaborative projects
- Accessing data base - Creating web sites
- Simulations - Games
- Communicate with other classrooms - On-line school newsletter/magazine
- Puzzles
• Computer skills

A shown in Table 5.1, basic computer skills can be infused within the content of the training programme.

Apart from designing activities for classroom teaching/learning, computers can also be helpful to teachers to manage their responsibilities and paperwork, which needs to be included in the training programme, while imparting computer skills.

• Networking and collaborating

Every ICT training programme can initiate both on-line networks as well as physical networks of teachers from neighbouring localities. These academic networks would hopefully help teachers collaborate, discuss and improve upon their capacities.

The training programme can focus specifically on equipping teachers for such kinds of collaboration and research.

ICT is here to stay. Rather than trying to prove use of ICT is better than other methods of teaching, focus should be on progressively improving use of ICT by teachers. This can be achieved not by pumping in funds and large scale projects but by empowering a large number of teachers to make use of ICT collaboratively and research their own use. Unless ICT use in schools conceptualized differently from what is being practiced now, NCF’s vision of constructivist classroom would remain a distant dream in Karnataka.
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## List of Sample Schools

<table>
<thead>
<tr>
<th>Radio</th>
<th>CAL/Radio</th>
<th>CAL/Radio/Edusat</th>
</tr>
</thead>
</table>
| 1. GHPS, Sri. Gandhakavlu, Sunkadakatte | 1. GMPS, Srinagar  
2. GMPS, Mathikere  
3. GMPS, Jeevanabhimanagar  
4. GMPS, Gottigere  
5. GLPS, Murugeshpalya  
6. GHPS, Yeshwanthpura Santhebeedhi  
7. GHPS, Kadirenahalli  
8. GHPS, Bytarayanapura  
9. GHPS, Banjarapalya  
10. GHPS, Kagalipura  
11.GHPS, Tavarekere  
12. GHPS, Yediyur  
13. Shri Raja Rajeshwari  
14.GMPS, Attikuppe  
15. GHPS, Uttarhalli  
16. GKBMS, Chamarajpet  
17. GHPS, Basavangudi | 1. GHPS, Nagavara  
2. GMPS, Harohalli  
3. GMPS, Bashettahalli  
4. GHPS, Kachuvanahalli  
5. GHPS, Dalimba  
6. GHPS, Tagachagere |
### Form 1: School Details

1. Name of school:  
1.1 School DISE Code: ________________

2. School strength:  
3. Nature of school: HPS / LPS  
4. Does the school have a radio?  
   - Yes □ No □  
5. Does the school have a tape-recorder?  
   - Yes □ No □  
6. Does the school have a television?  
   - Yes □ No □  
7. How many computers are there in the school? ________________
   7.1 How many are in working condition? ________________  
   7.2 How many of them support multimedia? ________________  
   7.3 Are there educational CD ROM titles in the school?  
      - Yes □ No □  
7.4 Does the school have internet connection? a. Stand alone b. Thin client  
8. For how many hours during the school-day do you get power, on an average?  
   - a. Less than 2 hrs b. 2-3 hrs c. 3-4 hrs d. > 4 hrs  
8.1 If no, is there a working back-up power supply?  
   - Yes □ No □  
9. Is there a separate computer Instructor/Teacher  
9.1 If yes, her/his training details ________________  
10. In which year was:  
10.1 CAL programme introduced? ________________  
10.2 Radio programme introduced? ________________  
10.3 Edusat programme introduced? ________________
Form 2: Teachers’ Questionnaire

Instructions: Please fill in your answers in the underlined space provided. In place where you find a box, please put a cross X in the appropriate box(es) and leave the remaining blank.

1. Name ____________________________________________

2. Age ____________________________________________

3. Gender __________________________________________

4. General Qualification
   a. Graduate □
   b. Post Graduate □
   c. Any other ____________________________
      (Please Specify)

5. Your subject of specialization ____________________________________________

6. Professional Qualification
   a. B.Ed □
   b. M.Ed □
   c. Any other ____________________________
      (Please Specify)

7. No.of years of teaching experience ____________________________________________

8. Which subject(s) do you teach? ____________________________________________

9. Classes that you handle ____________________________________________

10. Do you have a working knowledge of computers? Yes □ No □

11. Do you have a computer in your house? Yes □ No □
    If yes, do you have Internet connection at home? Yes □ No □

12. 12 a. In the course of your teaching, have you ever found any lacunae in the content covered by the prescribed text books? Yes □ No □
12 b. If your answer to the previous question is yes, which one of the following resources do you use to fill up the lacunae?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reference books</td>
<td></td>
<td>Yes □ No □</td>
</tr>
<tr>
<td>1.1 If yes, is/are the books(s) that you use:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Newspapers</td>
<td></td>
<td>Yes □ No □</td>
</tr>
<tr>
<td>2.1 If yes, please mention the name of the newspaper(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 Please mention any three activities for which you use the newspaper, in your classroom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Radio</td>
<td></td>
<td>Yes □ No □</td>
</tr>
<tr>
<td>3.1 Mention the programmes that you felt were most useful</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2 Why do you find them useful?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3 Please describe briefly how you use the radio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4 Do you use audio tapes in your classroom?</td>
<td></td>
<td>Yes □ No □</td>
</tr>
<tr>
<td>3.5 If yes, please specify the context in which you use them.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Television</td>
<td></td>
<td>Yes □ No □</td>
</tr>
<tr>
<td>4.1 If yes, please mention the name of the channel(s) that you use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2 Do you use a television programme to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3 Do you have Edusat</td>
<td></td>
<td>Yes □ No □</td>
</tr>
<tr>
<td>4.4</td>
<td>If yes, what programmes did you find most useful?</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>______________________________________________</td>
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<td>______________________________________________</td>
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<td></td>
<td>______________________________________________</td>
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<tr>
<td></td>
<td>______________________________________________</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.5</th>
<th>Why do you find them useful?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>______________________________________________</td>
</tr>
<tr>
<td></td>
<td>______________________________________________</td>
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<tr>
<td></td>
<td>______________________________________________</td>
</tr>
<tr>
<td></td>
<td>______________________________________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.6</th>
<th>Please describe briefly how you use the Edusat programme</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>______________________________________________________</td>
</tr>
<tr>
<td></td>
<td>______________________________________________________</td>
</tr>
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<td></td>
<td>______________________________________________________</td>
</tr>
<tr>
<td></td>
<td>______________________________________________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.</th>
<th>CD ROM’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>If yes, please mention the titles that you use</td>
</tr>
<tr>
<td></td>
<td>______________________________________________</td>
</tr>
<tr>
<td></td>
<td>______________________________________________</td>
</tr>
<tr>
<td></td>
<td>______________________________________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.2</th>
<th>Do you use the CD ROM to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes ☐ No ☐</td>
</tr>
</tbody>
</table>

|     | a. Gain information for yourself ☐ |
|     | b. Allow students to gather additional information ☐ |
|     | c. Develop activities for the students ☐ |
|     | d. Any other ______________________|

<table>
<thead>
<tr>
<th>6.</th>
<th>Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>If yes, do you use the internet as:</td>
</tr>
<tr>
<td></td>
<td>______________________________________________</td>
</tr>
<tr>
<td></td>
<td>______________________________________________</td>
</tr>
</tbody>
</table>

| 6.2 | Do you validate the information on the internet? |
|     | Yes ☐ No ☐ |

|     | a. A source of information ☐ |
|     | b. A means of teaching ☐ |
|     | c. A medium for communication with experts ☐ |
|     | d. Any other ______________________|

| 6.3 | If yes, are the criteria for validation |
|     | ______________________________________________|
|     | ______________________________________________|

| 6.4 | Please list any three criteria that you use to evaluate the web sites |
|     | ______________________________________________|
|     | ______________________________________________|

<table>
<thead>
<tr>
<th>6.5</th>
<th>Are you a member of any on-line group?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes ☐ No ☐</td>
</tr>
</tbody>
</table>

|     | a. Self-developed ☐ |
|     | b. From other source ☐ |
|     | c. Any other ______________________|

<table>
<thead>
<tr>
<th>6.6</th>
<th>If yes, please provide the name(s) of the new group(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>____________________________________________________</td>
</tr>
<tr>
<td></td>
<td>____________________________________________________</td>
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<tr>
<td></td>
<td>____________________________________________________</td>
</tr>
</tbody>
</table>

|     | ____________________________________________________|
|     | ____________________________________________________|
|     | ____________________________________________________|

|     | ________________________________|
|     | ________________________________|
|     | ________________________________|

|     | ________________________________|

|     | ________________________________|

|     | ________________________________|

|     | ________________________________|

|     | ________________________________|
13.1 Have there been instances when children have learnt a topic through one of these resources programme without you having to teach it in the classroom?
   a. CD
   b. Radio lesson
   c. Edusat

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13.2 If yes, please mention the class(es) topic(s)

<table>
<thead>
<tr>
<th>Class:</th>
<th>Subject:</th>
<th>Topic:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. Listed below are different kinds of resources. Please indicate your preference with respect to each by placing a cross mark in the appropriate box:

<table>
<thead>
<tr>
<th>Resources</th>
<th>Most preferred</th>
<th>Preferred</th>
<th>Somewhat preferred</th>
<th>Least preferred</th>
<th>Not at all preferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Books</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Newspapers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Radio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Television programmes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. CD ROM’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Internet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15.

15.1 Please mention the problem you face in making use of the afore-mentioned resources in the classroom. Please be specific as to the nature of the problem.

_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

15.2 Based on your experience, please provide solutions to the problems you have raised. These solutions may be the ones that you have already implemented in your classrooms, or those that you would like to do so in future.

_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

_______________________________________________________________________________
R.V. Educational Consortium
Rashtreeya Sikshana Samithi Trust, Jayanagar, Bangalore-11

Form 3: Guidelines for Observation of Computer class

1. Class : 

2. Subject : 

3. No. of students : 

4. No. of students per computer : 

5. Seating arrangement of students : 

6. How many students can operate the computer: All/ Majority /Only a few/ None : 

7. Title(s) of CD(s) being viewed : 

8. Stage at which CD is being used: (before, during or after a topic has been taught) 

9. Whether all students are viewing the same CD simultaneously : 
   If yes, whether they are doing so in a single group or in small groups : 
   If in a single group, how the other children are occupied : 

10. Level of interaction between teacher and students : 

11. Level of participation by students : 

12. Intervention by teacher : 

13. Confidence shown by students in handling the computer : 

14. Interaction among students : 

15. Motivation shown by students in using CD’s : 

16. Discipline maintained by students : 

17. Whether the activities/concepts covered in the CD were reviewed and summarised by the teacher: 

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Form 4: Guidelines for Observation of Radio lesson

1. Class: __________________________________

2. Subject: __________________________________

3. No. of students: _____________________________

4. Title of the radio lesson: _____________________________

5. Stage at which radio lesson is being used: _____________________________

6. Whether the lesson is being repeated: _____________________________
   (To ascertain from students)

7. Level of interest shown by children in the lesson: _____________________________

8. Participation by students: _____________________________

9. Interaction between teacher and students: _____________________________

10. Activities carried out by the students during the session: _____________________________

11. Seating arrangement of children during Activity: _____________________________

12. Whether the instructions provided during the lesson were followed exactly: _____________________________
   12.1 If not, nature of alternatives/adaptations: _____________________________

12.2 If yes, whether there were problems in doing so: _____________________________

13. Discipline maintained by students: _____________________________

14. Whether the activities/concepts covered in the radio lesson were reviewed and summarized: _____________________________

   By the teacher:

15. Is the radio lesson aligned to the school subjects/classroom transactions: Yes □ No □

16. Participation by teachers: Active □ Passive □

17. Whether time management of radio lesson is a problem: Yes □ No □

17.1 If yes, How does the teacher address it: _____________________________
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Class:</td>
<td></td>
</tr>
<tr>
<td>2. Subject:</td>
<td></td>
</tr>
<tr>
<td>3. No.of students:</td>
<td></td>
</tr>
<tr>
<td>4. Title of the programme:</td>
<td></td>
</tr>
<tr>
<td>5. Whether the programme was summarized/reviewed by the teacher:</td>
<td></td>
</tr>
<tr>
<td>6. Stage at which the programme is being used:</td>
<td></td>
</tr>
<tr>
<td>7. Whether the lesson is being repeated:</td>
<td></td>
</tr>
<tr>
<td>8. Whether the TV presentation were clearly visible to all students:</td>
<td></td>
</tr>
<tr>
<td>9. Level of interest shown by the students:</td>
<td></td>
</tr>
<tr>
<td>10. Whether students were taking notes during presentation:</td>
<td></td>
</tr>
<tr>
<td>11. Discipline maintained by students:</td>
<td></td>
</tr>
<tr>
<td>12. Involvement of teachers:</td>
<td></td>
</tr>
</tbody>
</table>
**R.V. Educational Consortium**  
Rashtreeya Sikshana Samithi Trust, Jayanagar, Bangalore-11

**Form 6: Guidelines for Classroom Observation**

1. Whether the classroom is: Multi grade [ ] Single grade [ ]

2. Subject taught during observation: Kan [ ] Maths [ ] Science [ ] Social Science [ ] Eng [ ]

3. Class(es) handled by the teacher: ___________________________ No. of students: ___________________________

4. Gender of the teacher: Male [ ] Female [ ]

5. **Classroom Environment**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Is the classroom clean?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>5.2 Is there a seepage-free even flooring?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>5.3 Is there a secure, leak-proof roof?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>5.4 Is the classroom well ventilated?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>5.5 Are there benches / desks for children?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>5.6 If no, how are the children seated?</td>
<td>In rows / In groups</td>
</tr>
<tr>
<td>5.7 Did the children keep their bags stacked?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>5.8 Is there a table / chair for the teacher?</td>
<td>Yes / No</td>
</tr>
<tr>
<td>If yes, how often did the teacher sit on the chair?</td>
<td>Rarely / often / very often</td>
</tr>
<tr>
<td>5.9 Are there visuals displayed?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>If yes, are they:</td>
<td>Student created/teacher created/purchased?</td>
</tr>
</tbody>
</table>

6. **Classroom Management**

<table>
<thead>
<tr>
<th>Question</th>
<th>Inside the classroom / outside the classroom</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1 Where was the class conducted?</td>
<td></td>
</tr>
<tr>
<td>6.2 If inside the class, were the students seated in one place throughout the class?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>6.3 Did the teacher attend to the seating arrangement of the children?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>6.4 How frequently did children write?</td>
<td>Not all / once in a while / often</td>
</tr>
<tr>
<td>6.5 While the children wrote, did the teacher go around checking their work?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>6.6 Did the teacher expect complete silence in the classroom?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>6.7 Did the teacher spend extra time with slow learners?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>6.8 How did the teacher engage students who finished their work ahead of others?</td>
<td></td>
</tr>
</tbody>
</table>
### 7. Teaching (provide details for all items under this category)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1. Games played</td>
<td></td>
</tr>
<tr>
<td>7.2 Activities given</td>
<td></td>
</tr>
<tr>
<td>7.3 Use of:</td>
<td></td>
</tr>
<tr>
<td>a. Models</td>
<td></td>
</tr>
<tr>
<td>b. Charts</td>
<td></td>
</tr>
<tr>
<td>c. Textbook</td>
<td></td>
</tr>
<tr>
<td>d. Other books,</td>
<td></td>
</tr>
<tr>
<td>e. Newspaper</td>
<td></td>
</tr>
<tr>
<td>f. Magazines</td>
<td></td>
</tr>
<tr>
<td>g. Computer / CD</td>
<td></td>
</tr>
<tr>
<td>h. Any other teaching aid (please specify)</td>
<td></td>
</tr>
<tr>
<td>7.4 Stories / anecdotes / examples given</td>
<td></td>
</tr>
<tr>
<td>7.5 Dramatization / Role play done</td>
<td></td>
</tr>
<tr>
<td>7.6 Use of blackboard</td>
<td></td>
</tr>
<tr>
<td>7.7 Drill work / practice given</td>
<td></td>
</tr>
<tr>
<td>7.8 Use of surrounding environment</td>
<td></td>
</tr>
<tr>
<td>7.9 Written / oral work given</td>
<td></td>
</tr>
<tr>
<td>7.10 Grouping of children</td>
<td></td>
</tr>
</tbody>
</table>

### 8. Integration with CD’s / Radio/Edusat (Please provide the following details if this is being done)

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>8.1 Link with previous CD’s / Radio/Edusat viewed</td>
<td></td>
</tr>
<tr>
<td>8.2 Instruction for viewing CD/Radio/Edusat relevant to the topic being taught</td>
<td></td>
</tr>
<tr>
<td>8.3 Background information / Preparatory work for students before viewing CD /Radio/Edusat</td>
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</tr>
<tr>
<td>8.4 Suggestions/Ideas/Discussions based on CD’s/Radio/Edusat</td>
<td></td>
</tr>
<tr>
<td>8.5 Any Other</td>
<td></td>
</tr>
<tr>
<td>9. Were these resources used for students project work</td>
<td>Yes/No</td>
</tr>
<tr>
<td>9.1 If yes, How was it used</td>
<td>Individual / Group</td>
</tr>
<tr>
<td>9.2 Please provide details:</td>
<td></td>
</tr>
</tbody>
</table>
1. Do they like coming to school? Why?

2. What do they enjoy most? Why?
   - Using CD’s
   - Listening to radio lessons

3. Do they face difficulties in using computers? If yes, what?

4. What do they do using computers?

5. Do they play computer games? If yes, please provide details

6. What are their favourite CD titles?

7. What concepts have they learnt best using CDs?

8. Do they find radio lessons interesting? Why/Why not?
9. Do they face difficulties while listening to radio programmes? If yes, what?

10. What activities have they enjoyed most in the radio lessons?

11. What concepts have they learnt best through radio lessons?

12. Do they find TV lessons interesting? Why/Why not?

13. Do they face difficulties while viewing TV programmes? If yes, what?

14. What TV programme have they liked most?

15. What concepts have they learnt best through TV?

16. What do they find different while learning using computers/radio/TV and their regular classroom teaching?

17. Do they prefer technology to their teacher? Why
## Time Table for Computer classes

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<tr>
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<td>10:00</td>
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Time Table for Radio Lessons

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<td>55</td>
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</tr>
<tr>
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<td>56</td>
<td>Balipadyami</td>
</tr>
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<td>14/10/2009</td>
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<td>15/10/2009</td>
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**Table Data**

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<td>Data 3</td>
<td>Data 4</td>
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<tr>
<td>Data 5</td>
<td>Data 6</td>
</tr>
</tbody>
</table>

**Diagram**

Diagram of a cube.
117

...

...
| ಕ್ರಮ ನೂ ವಿವರಣೆ | ಪ್ರತ್ಯೇಕಿಸುವ ವಿವರಣೆ | ಪದ್ಭಾವ | ಅಂಗಸೇವೆ/ ತಾಜ್ಯ ಸಂಖ್ಯೆ | ಕಾಲಾ |  |
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| 3. ಇತರ್ವ್ಯುಪಾತ್ರೆ | ಇತರ್ವ್ಯುಪಾತ್ರೆ | ಇತರ್ವ್ಯುಪಾತ್ರೆ | ಇತರ್ವ್ಯುಪಾತ್ರೆ | ಇತರ್ವ್ಯುಪಾತ್ರೆ |  |
| 4. ಇತರ್ವ್ಯುಪಾತ್ರೆ | ಇತರ್ವ್ಯುಪಾತ್ರೆ | ಇತರ್ವ್ಯುಪಾತ್ರೆ | ಇತರ್ವ್ಯುಪಾತ್ರೆ | ಇತರ್ವ್ಯುಪಾತ್ರೆ |  |

**Notes:**
- ಕ್ರಮ ನೂ ವಿವರಣೆ: ಇತರ್ವ್ಯುಪಾತ್ರೆ
- ಪ್ರತ್ಯೇಕಿಸುವ ವಿವರಣೆ: ಇತರ್ವ್ಯುಪಾತ್ರೆ
- ಪದ್ಭಾವ: ಇತರ್ವ್ಯುಪಾತ್ರೆ
- ಅಂಗಸೇವೆ/ ತಾಜ್ಯ ಸಂಖ್ಯೆ: ಇತರ್ವ್ಯುಪಾತ್ರೆ
- ಕಾಲಾ: ಇತರ್ವ್ಯುಪಾತ್ರೆ
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<td>वोल्ट</td>
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विवरण: विषयस्थिति, मूल्यक्षमता, उपयुक्तता, विवरण.
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<th>მიხედვა</th>
<th>აღწერა</th>
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20.10.9

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</table>
| 3.       | მარიო | გერმანული |          | დარღვევის სწორობა |}

30.10.9

<table>
<thead>
<tr>
<th>დარღვევა</th>
<th>სახელი</th>
<th>ტაობი</th>
<th>მიხედვა</th>
<th>აღწერა</th>
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</thead>
</table>
| 4.       | მარიო | გერმანული |          | დარღვევის სწორობა |}

31.10.9

<table>
<thead>
<tr>
<th>დარღვევა</th>
<th>სახელი</th>
<th>ტაობი</th>
<th>მიხედვა</th>
<th>აღწერა</th>
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</thead>
<tbody>
<tr>
<td>5.</td>
<td>მარიო</td>
<td>გერმანული</td>
<td></td>
<td>დარღვევის სწორობა</td>
</tr>
<tr>
<td>Activity</td>
<td>Teaching Materials</td>
<td>Competencies</td>
<td>Methodology</td>
<td>Date</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------</td>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td></td>
<td>Text and Book</td>
<td>Pupils learn to use polite expressions, later they are asked to mark the polite words in the prose.</td>
<td>Tr reads the text, role play, the conversation in the lesson, many times practised in the class.</td>
<td></td>
</tr>
<tr>
<td>Learn</td>
<td></td>
<td>Pupils are asked to demonstrate</td>
<td>The Activity in use once, the text is read twice, thrice. Many times practised in the class.</td>
<td></td>
</tr>
<tr>
<td>ing</td>
<td></td>
<td>Pupils are asked to use adverbs: always, never, to their friends and sometimes in other groups. Use adverbs - never, always.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exer</td>
<td>Role play</td>
<td>Pupils are asked to play the role of frequent questions.</td>
<td>The Grammar points in the text.</td>
<td></td>
</tr>
<tr>
<td>Role</td>
<td>Use adverbs</td>
<td>Pupils are asked to use adverbs: always, never, to their friends and sometimes in other groups. Use adverbs - never, always.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluate</td>
<td>Learn the Grammar</td>
<td>Pupils are asked to use adverbs: always, never, to their friends and sometimes in other groups. Use adverbs - never, always.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lesson: The Honest Driver.

Competencies: Pupils learn to use polite expressions. Pupils demonstrate learning of antonyms through games. Learn to use once, twice, thrice, many times. Learn to use adverbs of frequency: always, never, and sometimes. Develop the ability to tell time in English. Identify the sounds produced.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Teaching Materials</th>
<th>Competencies</th>
<th>Methodology</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-learning</td>
<td>Clock and Questions</td>
<td>Develop the ability to tell the time in English.</td>
<td>To show different time on the clock and ask a few questions &amp; ask them to tell the time in English.</td>
<td></td>
</tr>
<tr>
<td>Learning</td>
<td>Flash Cards Learning of Antonyms</td>
<td>Learning</td>
<td>To make pupils stand in two rows and give them flash cards and find the partners of the antonym word and spell the words and antonyms.</td>
<td></td>
</tr>
<tr>
<td>ನಂ.</td>
<td>ಹೆಸರು/ಕರ್ನಾಲಿ</td>
<td>ಬರೆಯಬೇಕು ಆಡಳಿತ</td>
<td>ರೈತ ಪ್ರಮಾಣೀಕರಣ ಸಂಖ್ಯೆ</td>
<td>ಸೇರುವ ಪಟ್ಟಿ</td>
</tr>
<tr>
<td>------</td>
<td>------------------</td>
<td>----------------------</td>
<td>--------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>1</td>
<td>ವಿಜಯ ಕುಮಾರ</td>
<td>ಬರೆಯಲಾಗುತ್ತದೆ</td>
<td>1234567890</td>
<td>012345</td>
</tr>
<tr>
<td>2</td>
<td>ಕೃಷ್ಣ ಕೊಳ್ಡಿ</td>
<td>ಬರೆಯಲಾಗುತ್ತದೆ</td>
<td>9876543210</td>
<td>098765</td>
</tr>
<tr>
<td>3</td>
<td>ಮುಖೇಶ್ವರ್ ಆದಿ</td>
<td>ಬರೆಯಲಾಗುತ್ತದೆ</td>
<td>1122334455</td>
<td>543210</td>
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<tr>
<td>4</td>
<td>ಶ್ರೀನಿವಾಸ್ ಸಹ್ಯಾರ</td>
<td>ಬರೆಯಲಾಗುತ್ತದೆ</td>
<td>6677889900</td>
<td>009876</td>
</tr>
</tbody>
</table>

ಉಲ್ಲೇಖಿಸಿರಬೇರೆ, ಒಂದು ರೈತ ಪ್ರಮಾಣೀಕರಣ ಸಂಖ್ಯೆಯನ್ನು ಕೇಂದ್ರದಲ್ಲಿ ಬರೆಯಲಾಗುತ್ತದೆ.
<table>
<thead>
<tr>
<th>ನಾಮ</th>
<th>ಸತ್ಯಾಖರಿಸಿ</th>
<th>ಕಾಲ</th>
<th>ಬೆಳೆವಿಲ್ಲು</th>
<th>ಬೆಳೆಸಾಗಿಲ್ಲು</th>
</tr>
</thead>
<tbody>
<tr>
<td>ಬರೆ</td>
<td>ಸಮೂಹ ಪ್ರಾರುಣ</td>
<td>ಸಮೂಹ</td>
<td>ಬೆಳೆಯಿತು</td>
<td>ಬೆಳೆಸಾಗಿಲ್ಲ</td>
</tr>
<tr>
<td>ಸುತ್ತು</td>
<td>ಮುಂದೆ ಪ್ರತ್ಯೇಕ</td>
<td>ಮುಂದೆ</td>
<td>ಬೆಳೆಯಿತು</td>
<td>ಬೆಳೆಸಾಗಿಲ್ಲ</td>
</tr>
<tr>
<td>ಕಾಯಂ</td>
<td>ಸಿಸಿಪ್ರತಿಯಾಗಿ</td>
<td>ಸಿಸಿ</td>
<td>ಬೆಳೆಯಿತು</td>
<td>ಬೆಳೆಸಾಗಿಲ್ಲ</td>
</tr>
<tr>
<td>ದಿನ</td>
<td>ಸ್ವಾಮಿ ಪುರಾಣ</td>
<td>ಸ್ವಾಮಿ</td>
<td>ಬೆಳೆಯಿತು</td>
<td>ಬೆಳೆಸಾಗಿಲ್ಲ</td>
</tr>
<tr>
<td>ಚಿತ್ರ</td>
<td>ಪ್ರತ್ಯೇಕ ಪ್ರತಿ</td>
<td>ಪ್ರತಿ</td>
<td>ಬೆಳೆಯಿತು</td>
<td>ಬೆಳೆಸಾಗಿಲ್ಲ</td>
</tr>
</tbody>
</table>

**ತಿಳಿಗಳು:***
- ಸಂಸಾರ ಪ್ರತಿಮೆಗಳಲ್ಲಿ ಬೆಳೆಯಿತು.
- ಬೆಳೆಯಿತು ಮತ್ತು ಬೆಳೆಸಾಗಿಲ್ಲ ಪ್ರತಿಗಳಿಗೆ ತಿಳಿಯಲ್ಲಿಯೂ ತಿಳಿಯಲ್ಲಿ.

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Appendix 6

School Time Table