

**PILOT TESTING OF PERFORMANCE INDICATORS FOR  
INFORMATION & COMMUNICATION TECHNOLOGY (ICT)  
IN EDUCATION IN INDIA**

**A STUDY OF ICT USAGE IN 1000 SCHOOLS OF INDIA**

**- Sponsored by -**

**United Nations Educational Scientific and Cultural Organisation (UNESCO)**

**Bangkok**

**&**

**Ministry of Human Resource Development, Government of India**

**2005**

**\*\*\*\*\***

## **Implementing Team**

### **A. Empowered Committee**

- Mr. S.P. Gaur, Joint Secretary (MHRD)
- Mr. Viresh Sinha, Secretary (Education) Government of Gujarat
- Mr. V.N. Joshi, Secretary (Education) Government of Karnataka
- Ms. Carmelita Villanueva (UNESCO)
- Ms. Jayanti Ravi, Commissioner (Education), Government of Gujarat
- Dr. M.S. Verma, Director, Central Tibetan Schools Administration
- Mr. D. Jagannatha Rao, Director, DSERT, Karnataka
- Mr. Y.T. Gurumurthy, Deputy Director, DSERT, Karnataka
- Mr. G.J. Rawal, Joint Director, Gujarat
- Mr. V.R. Patil, Commissioner (Education) Government of Karnataka
- Mr. Vivek Bharadwaj, Director (MHRD)

### **B. Data Collecting Team**

Officials from Districts Education Offices and volunteers.

### **C. Nodal Officers**

- Mr. Vivek Bharadwaj, Director (MHRD)
- With assistance from Ms. Carmelita Villanueva (UNESCO)

\*\*\*\*\*

**A Report By**  
**Vivek Bharadwaj**

\*\*\*\*\*

## CONTENTS

	<b>Page Nos.</b>
Acknowledgement	7
Executive Summary	8
1. Background	21
2. Objectives, Rationale & Assumptions	34
3. Methodology	40
4. Findings	43
5. Validity, Acceptability & Functionalities of Indicators	255
6. Observations & Recommendations	274
7. References	288
8. <b>Annexures:</b>	
i) Information and Communication Technology @ Schools Scheme	289
ii) Mahithi Sindhu	304
iii) Rajiv Gandhi Computer Literacy Programme	305
iv) Extract from the 'National Policy On Education – 1986'	306

		<b>Page Nos.</b>
<b><u>Annexures</u></b>		
v)	Questionnaire for Head of School	: 306
vi)	Questionnaire for Teachers & Teaching staff	: 315
i)	Questionnaire for Students	: 322
viii)	Area wise Distribution of Staff Surveyed	: 328
ix)	Age Distribution of Staff Surveyed	: 329
x)	Usage of ICT in Different Subjects	: 330
i)	Number of In-Service Trained Teachers	: 331
xii)	Teachers with E-mail Addresses & Personal Web Page	: 332
xiii)	Gender distribution of Students	: 333
xiv)	Distribution of Students according to period of Usage of computers	: 334
xv)	Area orientation of Students having different Level of skills in Basic Computer Applications	: 335
xvi)	Academic level of Students having different levels of skills in Basic Computer Applications	: 337
xvii)	Distribution of Students having different levels of skills in Intermediate Computer Applications	: 339
xviii)	Area orientation of Students having different levels of skills in Intermediate Computer Applications	: 340

**Page Nos.**

**Annexures**

i)	School Management & Students Level of skills : in Intermediate Computer Applications	341
ii)	Gender Distribution of Students having different : levels of skills in Intermediate Computer Applications	342
xxi)	Distribution of Students Having Access to the : Internet	343
xxii)	Educational statistics of Karnataka	: 344
xxiii)	Educational statistics of Gujarat	: 345

**\*\*\*\*\***

## **ACKNOWLEDGEMENT**

\*\*\*\*\*

I am deeply indebted to the Implementing Team of the Pilot Project without whose assistance the project would not have been completed and there would have been no Report to write! Mrs. Jayanti Ravi and Shri Rawal in Gujarat alongwith Mr. Rao and Mr. Gurumurty in Karnataka provided leadership in their respective States to the hundreds of officials and surveyors who administered the questionnaire in the interiors. It was their perseverance and focus on accuracy and quality, which is reflected in the data collected.

Mr. C. Balakrishnan and Mr. S.P. Gaur alongwith Dr. M.S. Verma were a constant source of support and were instrumental in ironing out the many problems which invariably arise in such a large project.

If there is one person who could be identified with both the initiation of the project and its completion, it is certainly Mrs. Carmelita Villanueva. She was the one who consented to the testing of the indicators in India and constantly guided the project through her e-mails. Later the mantle fell upon Dr. Ko-Chih Tung and Mr. Cedric Wachholz. My grateful thanks.

## **EXECUTIVE SUMMARY**

Though computers came to Indian classrooms in the year 1984-85, the level of adoption of modern technology in the teaching and learning process has been limited and uneven. Possibly there has been no comprehensive study or survey on the use of ICT in schools in India. This study attempts not only to provide a snap-shot of the situation on the ground but also to serve as a bench mark for further studies in this area. The results of the study could act as a catalyst for change and for providing a road map.

An important aim of this study is to promote utilization of data connected with ICT in education and undertaking advocacy work to convince education policy-makers and administrators to mainstream the collection and maintenance of indicators into their State educational policies and management information systems. The objectives of the study were:

3. To monitor and evaluate the use and outcomes of ICT in education in India in order to provide benchmarks for policy and programme improvements.
4. To show the relationship between technology use and changes in teaching and learning process, as well as educational curricular improvements.
5. To pilot test a set of indicators developed by UNESCO Bangkok in collaboration with selected countries in the region.

To arrive at the above objectives the pilot testing employed the following methodologies in collecting data:

3. Review and analysis of records, files and documents
4. Survey using questionnaires
5. Interview of key informants

In view of the large size of the country and the fact that the number of primary & secondary schools run into hundreds of thousands, two representative States were

selected – Gujarat in Western India and Karnataka in South India. Again two Districts in two different areas of the States were selected for the Pilot project. Schools in the capital cities of the two States were also surveyed to reflect the different stages of development in the use of ICT in teaching and learning.

The survey used multistage random sampling and the sample unit was the school. This methodology produced the following sample size:

- Number of schools : 1000.
- Number of teachers : 6239.
- Number of students : 35,547.

The survey took place in the early part of 2004. Out of the 1,000 schools surveyed, 500 each were in the States of Gujarat in the West and Karnataka in the South of the Country. Out of these 500 schools, 200 each were in the Districts of Patan and Surendranagar in Gujarat and Bellary and Mandya in Karnataka. 100 schools each were also assessed in the capital cities of Ahmedabad in Gujarat and Bangalore in Karnataka. In Gujarat the ratio of the number of urban schools to rural ones was 26:65.8 and in Karnataka it was 37.6:53.6.

A majority of the schools surveyed in both the States were Government or Public Schools. Out of the 1,000 schools, 602 (60.2%) were Government Schools and 398 (39.8%) were Private Schools. There were more Government Schools at 66.2% in the sample of the State of Karnataka. The ratio of Primary to Secondary Schools was approximately equal. Out of the total 1,000 schools 49.7% were primary and 51.3% were secondary. The total number of students enrolled in these 1,000 schools were 2,24,018. Out of these 1,21,029 were in Gujarat and 1,02,989 were in Karnataka. The total number of boys in these 1,000 schools were 1,25,714 while the number of girls was substantially less at 98,304. The total number of staff members in these schools were 10,777. Out of these the number of teaching staff were 7,963, non teaching staff were 1,631 and administrative staff were 1,183.

## **Observations & Recommendations:**

1) The first major finding of the survey is that the use of ICT in Education is very limited in the country whether measured by the number of schools having an ICT Department or Unit (20.4%), the availability of a budget in schools for its implementation (6.5%), the number of teachers trained at ICT, the per capital availability of hardware and so on and so forth.

2) The access to ICT facilities whether by students or by teachers was of great concern. In the 200 schools surveyed in Surendranagar there were only two Multi-media Projectors, three PDAs and four Scanners. Even in Ahmedabad there were only 589 Desktop Computers reported in 100 schools. This means less than six computers per school and one computer for 72 students on an average. There is thus a great need for increasing the availability of various ICT tools.

3) While there is a relatively better availability of older technologies like the TVs or RCPs, newer technological products like Multi-media Projectors, Laptops and PDAs, which make learning more student-centric, were scarce. In the 200 schools in Mandya, for example there was not a single Multi-media Projector, LCD Projector, Scanner or a PDA. The survey found that the abundance of different technologies was directly related to their vintage. Older equipment like TVs, RCPs and Desktop Computers were more abundant than Multi-media Projectors and Hand-held Computers.

4) As the increased availability of these technologies in the country would take time, it would be a sensible strategy to concentrate on utilizing traditional media like the radio and the television. These technologies also have an edge over Desktops or Laptops as more students can utilize them at any given time. As mentioned earlier, in Gujarat schools it was the TV and then the RCPs, which were available in maximum numbers.

5) Training of teachers in ICT was another area of concern. A majority of schoolteachers surveyed in the two States were without any training on ICT tools. In

Karnataka 87% were not trained and in Gujarat 81% of the teachers had no training in ICT.

6) It was also found that most of the teachers who have acquired training did so while in service. Only 3.1% of the teachers in Gujarat and 5.5% teachers in Karnataka had acquired such proficiency before joining the profession. This obviously has an important implication for the formulation of the curriculum of Teachers' Training Colleges throughout the country and also for the National Council for Teachers' Education (NCTE).

7) An area of concern was the quality of training imparted. When the responding Heads of Schools were queried about the competence of the teachers who had been trained at ICT, many of them reported that though the teaching staff had received training they still had *no* capability ! While this figure was low in Gujarat it was quite significant in Karnataka at 20.2%. Maximum number of teachers was rated as having a fair amount of expertise in Gujarat, while in Karnataka the maximum number was only rated as good. The quality and methodology of training was thus a serious issue and needs to be given greater attention than to mere numbers of teachers trained as at present.

A surprising fact noticed when assessing the level of expertise of the teachers in the various aspects of ICT was that even teachers who were somewhat familiar with ICT, having used it for less than an year had no capability even in simple uses like Word Processing or E-mailing. It thus seems that the quality of training imparted to the teachers was not of a satisfactory level.

8) The hypothesis that even where ICT tools were available there was low level of integration in education was validated as both Principals and teachers stated that ICT tools were most used for teaching ICT as a subject. In Gujarat, for example teachers stated that ICT was used most for teaching computers as a subject and then for sciences. In Karnataka, computer classes were the second most important subject for which ICT was used. There was little utilization of these tools in Social Science and

Music in Gujarat and in Music and Art in Karnataka. Principals reported that they were used least for teaching the local language. The maximum percentage of respondents who stated that one subject for which computers were always used was ICT – both in Gujarat (8.2%) and in Karnataka (11.8%). It is generally thought that the best way to encourage ICT adoption in a country is to make content widely available in the local language(s). Policy makers need to devise an appropriate incentive mechanism to address these issues.

9) The low level of access has been commented upon earlier too. This was true not only for students but also for teachers. Adding the number of Principals, which had not responded, and the ones, which had responded that no teacher had access to computers in their school it was found that 75.2% of the Karnataka teachers did not have access to computers while 71.4% of the teachers in Gujarat were in the same situation. This is a surprising state of affairs in a country, which claims to be an IT superpower. Perhaps there is a need to provide linkages between educational institutions and IT companies to better utilise IT equipment being periodically replaced by them.

10) The lack of Internet connectivity came-up starkly and repeatedly during the survey. This had its own impact on the various uses to which ICT could be put to by both the teachers and students. However, these uses remained largely unutilized as only 8.6% of the teachers in Gujarat and 8.8% of the teachers in Karnataka had access to the Internet, whether at school or outside.

As far as students were concerned, only 4.2% students stated that they had access to the Internet in Gujarat. This number was 12.8% in Karnataka. In Gujarat 79% of the students surveyed could not E-mail and 78.3% could not browse. In Karnataka an even larger percentage (87.3%) could not E-mail and 89.5% could not browse. The frequency of use of Internet for surfing websites in schools, for example were instructive. 55.4% of the students surveyed in Gujarat stated that they had never surfed the Internet. The proportion of students who surfed the Net daily was 0.1% !

There was only a marginal difference in the usage of ICT tools when assessed according to the type of school-Private or Government-that the student attended. In Gujarat Private School students used ICT marginally more than Government School students for all purposes except for communication. In Karnataka Private Schools used ICT marginally more than Government Schools for communication, creation and functional purposes. Government School students used ICT more to find, acquire and use information.

11) While a relatively larger number of schools had an ICT Department or Unit a much lesser number had an ICT Coordinator to make the entire process effective. The number of schools which had an ICT Master Plan in place was even less. 20.4% of the total number of schools surveyed had an ICT Department or Unit. It is well known that without trained personnel the hardware is of little use. It was found that only 13.7% of the schools had an ICT Coordinator which was as mentioned earlier less than the number of schools which had an ICT Department. Purchase of hardware, training of teachers, procurement of educational content, scheduling of classes etc. all have to be part of a master plan to ensure maximum benefits. Very few schools had an ICT Master Plan in place, infact only 7.8%. This comprised 11% of schools in Karnataka and 4.6% in Gujarat. The importance of all these components is widely acknowledged. The data mentioned above only goes to shows that there is little perspective planning taking place. Perhaps there is a need for experts to develop a few model master plans for different types of schools which could be adopted/adapted by them according to their needs.

12) There has been steady but slow progress in the availability of ICT facilities for students in the country. An assessment of the length of time that computers had been with schools was made during the course of the survey. It was found that only a miniscule percentage of schools had computers 8 years back. These were also more noticeable in the urban areas which clearly points to the fact that computers first became accessible in towns. The maximum percentage of schools in Gujarat have acquired computers in the last 1-2 years while it was 2-4 years for Karnataka. The case

of rural Karnataka is instructive. While 8 years back there was no computers in any school, now about 18% have computers and the maximum number of computers were acquired in the last 2-4 years.

13) A possible lack of communication in propagating the components of the ICT policy framework to the schools was discerned. Less than 30% of the schools in Gujarat claimed to be implementing the regional policy on ICT. Surprisingly many more Private Schools claimed the same than Government Schools !

The focus of implementation of the Policy on ICT in Education differed in the two States. While in Gujarat the emphasis seemed to be on training teachers on ICT and then on using ICT in the management and administration of the school, in Karnataka using ICT for teaching specific subjects was most important and then was the training of teachers.

14) The study attempted to find a correlation between the number of years for which teachers have been using computers with the number of years of experience as a teacher. No significant correlation was found. Initiation in the use & practice of ICT was discernable only in the last 2 years.

15) What was of interest was that the expertise in the use of computers for various purposes was positively correlated with the number of years that the teacher had used computers. For example, only 11.3% of the teachers surveyed in Gujarat thought of themselves as excellent in using the spreadsheets when they had 2-4 years of experience of using computers. This jumped to 35.8% in the 4-6 years experience bracket.

16) An assessment was made of the level of expertise in the use of various software tools and applications. These ranged from simple ones like Word Processing, Power Point, Internet Browsing to Programme and Project Management. Teachers from Gujarat consistently reported better expertise at these applications than those from Karnataka. Interestingly, however teachers from both the States were best at Word

Processing and then at Presentation tools. In Gujarat they were least acquainted with Project Management and in Karnataka with web-page designing. In general the level of expertise was quite low. The expertise at even basic activities like E-mailing and Internet Browsing was fairly low primarily because of the lack of Internet access in schools. The major difference in the level of expertise remained between teachers from Ahmedabad and Surendranagar and those from Bangalore and Mandya. It was found that there was practically no expertise in higher order skills like web-page designing or data base management.

17) Students were questioned on the level of expertise acquired by them in using ICT tools. These skills were divided into basic, intermediate and advanced. Less than 20% students surveyed in Gujarat assessed themselves as excellent or very good in the basic use of ICT tools. Only word processing got more than 20% responses. The situation was worse in Karnataka where in general only 5-10% assessed themselves excellent or very good at these simple skills. Again, only word processing was relatively better. As stated earlier, there was in general low level of expertise. The conclusion that ICT tools are mostly being used for making presentation or documents but not for developing critical thinking is inescapable.

18) The declining levels of community participation in education came out clearly during the survey in both the urban and rural areas of the two States surveyed. ICT tools were least used for communicating with parents !

19) The location of computers is an important determinant of access to technology by the students. If Desktops are confined to the office or TVs to the residence of the Principal, these technologies would have no impact on the teaching-learning process. An assessment was made of the location of computers in schools. In Gujarat, location of computers in classrooms and in a computer laboratory was evenly distributed. In Karnataka computers were pre-dominantly located in Laboratories. Some were housed in the library also. The maximum number of computers in laboratories were in

Bangalore. None of the respondents ticked both classroom and the laboratory as the location of computers in Gujarat.

20) Students were also queried during the survey whether they possessed mobile phones, hand-held/PDA, E-mail addresses or a personal website/web-page. 5.9% of the total number of students surveyed in Gujarat had a mobile phone. This figure reached a high of 14.1% in Ahmedabad. Karnataka students had the maximum number of E-mail addresses. The district of Mandya in Karnataka surprisingly had the maximum number of E-mail addresses !

21) The general perceptions connected with private school education could not be reinforced by the findings. Infact there was only a marginal difference in the usage of ICT tools when assessed according to the type of school-Private or Government-that the student attended. In Gujarat Private School students used ICT marginally more than Government School students for all purposes except for communication. In Karnataka Private Schools used ICT marginally more than Government Schools for communication, creation and functional purposes. Government School students used ICT more to find, acquire and use information. While Private School students in Gujarat had 4 times more access to the Internet compared to their Government School peers, it was the reverse in Karnataka where 16.6% of Government School students had access to the Internet compared to 5.6% Private School students. Surprisingly, the percentage of students who used E-mails as a means of communication was marginally better in Government Schools in Gujarat and a little better for Government Schools in Karnataka.

Access of Government School students to ICT tools outside school was in general low. The access of Private School students to such devices was comparably better and pre-dominantly at home which implied a better socio-economic condition. This was true for both Gujarat and Karnataka.

The data was compared between Government and Private Schools to assess the effectiveness of the different school systems. In Karnataka, while Private School

students were better than their Government counter-parts in Word Processing, Spread Sheet, Graphics, Web Designing and Chatting, the Government School students were better at Presentation Tools, E-mailing and Internet Browsing. Similarly, while Private School students in Gujarat were better at Word Processing, Spread Sheets, Presentation Tools and Graphics, their Government counter-parts were better at E-mailing, Internet Browsing, Web Designing and Chatting. The results were therefore mixed.

Government School students liked to draw and paint most and play games next. It was the other way round for Private School students in Gujarat where 49.8% ranked playing games as their favourite activity using computers! In Karnataka also there was similarity in the choices with Gujarat where most of the Government School students liked to draw and paint most and play games next. The favoured activities of Private School students were the reverse to that of Government School students in Karnataka but same as that of private school students in Gujarat.

22) Government Schools in Karnataka were an example in themselves. School Heads in Karnataka reported that more Government School teachers (6.6%) had access to computers in school than those in Private Schools (4.7%).

While there was no difference in the mode of offering ICT courses or ICT based activities between Private and Government Schools in Karnataka as most offered them first as a separate and then integrated with other subjects, the emphasis on integrating technology was however apparent. The maximum number of hours spent on integrating ICT with other subjects was in Government Schools in Karnataka.

The survey showed that Government Schools in Karnataka had better access to the Internet (11.5%) compared to Private Schools where only 5.9% had such an access. The number of ICT Coordinators in the Government Schools of Karnataka (9.6%) were more than those in Private Schools (7.4%). More Government Schools in Karnataka had a website or an E-mail ID than Private Schools of the State. In

Karnataka the number of Government School teachers who were provided training while in service was 3 times the number of Private School teachers trained !

23) One of the assumptions of the study was that most of the ICT facilities are confined to boys and that the girl child is at a disadvantage. What the study revealed was an eye-opener. There were no gender differences discernable. In Gujarat more girls (55.8%) are using computers compared to boys (38.8%) and their numbers are also growing faster. This is apparent in Karnataka also specially in the last 2 years.

The access of girl students is much more to Desktop Computers in Gujarat. Data suggests that it is marginally more than boys for TVs, RCPs and even Lap-tops, CD Writers, Scanners and Computer Speakers. In Karnataka, the access of girl students to various ICT tools in schools is marginally more than boys to TVs, RCPs, Desktops, Computer Speakers, Scanners and CD Writers. Comparing girls in Karnataka with their counter-parts in Gujarat, one finds that RCPs, Desktop Computers and Computer Speakers are more accessible to girls in Karnataka. However, the availability of TVs to girls in Gujarat schools is more. Girl students in Gujarat had a distinctly better access to ICT tools for doing schoolwork. While this was also true for Karnataka the difference with boys was not as pronounced (Table S 17.5). Girls had better access to the Internet in both Gujarat and Karnataka (Table S 23.5) and it was best for Karnataka girl students where 4 times more girls than the number of boys claimed to be able to access the Net on a daily basis.

24) While it was difficult to come to the conclusion as to which among the two States was better in terms of access, utilization and effectiveness of ICT tools, what did come across repeatedly during the analysis was the fact that Gujarat had substantial disparities between its urban and rural areas and Private and Government Schools. For example, when students from the two States were questioned about their access to ICT tools for doing class-work, these ranged from 41.5% in the affirmative in Ahmedabad to

9.1% in the affirmative in Surendra Nagar. Access was more evenly distributed between the capital and the Districts in Karnataka (Table S 17.1).

Similarly in Gujarat access to ICT tools was maximum for Private School students at 28.3%. Only 4.7% of Government School children had such facilities. In Karnataka fortunately there was no digital divide discernable between the Private School and Government School students (Table S 17.3). As mentioned earlier Government School students in Karnataka had better access to the Internet. Overall too there was better availability of access to the Internet in Karnataka than in Gujarat. The responses of students to once a month and once a week usage was much better in the Districts of Bellary and Mandya compared to the Districts in Gujarat (Table S 23.1).

The number of students who had a mobile phone was 10 times more in Private Schools in Gujarat when compared to Government Schools. None of the Government School students had a PDA or an e-mail address or a personal website (Table S 24.3). In Karnataka the differences were not so stark. Infact the number of e-mail IDs were more in Government Schools than in private ones !

25) An analysis of the validity, accessibility and functionality of Indicators was the primary objective of the pilot testing. The study found that all the indicators developed by UNESCO, Bangkok in collaboration with countries in Asia broadly had all the requisite attributes. However, a few of them could not be completely tested during the survey, as there were no separate and distinct questions enumerated in the questionnaires for the purpose. (The questionnaires were designed by UNESCO, Bangkok for all the countries in the region where the pilot testing took place). These included for example, the frequency of use of computers for teaching, personal ownership of ICT tools and accessibility of the Internet at various locations.

The one exemption was the Indicator of hardware used in schools. The feedback received on this indicator suggested that most of the respondents did not find a direct linkage between the various types of operating systems or the technological

features of the hardware being used and the level of ICT integration into education. The validity, acceptability, usefulness and capability of direct measurement of the attribute were therefore limited. However, the indicator was amenable to collection of comparable data, which was reliable and consistent.

26) The Indicators developed by UNESCO, Bangkok in collaboration with selected countries in Asia and the wealth of the data generated while testing them on a pilot basis provided a snap shot of the situation on the ground. During the course of the survey several issues of concern have been identified which provide pointers for policy formulation. However, to ensure that policy formulation remains firmly rooted in ground level realities it is essential to mainstream the collection and maintenance of these Indicators. The NCERT conducts All India Education Surveys periodically where data is collected in the census mode. The survey would become more useful to Policy-makers, Planners and Educationists if the Indicators identified during the course of this study form a part of the survey.

\*\*\*\*\*

## **CHAPTER – I**

### **BACKGROUND**

India recognized the importance of Information & Communication Technology (ICT) in education as early as 1984-85 when the Computer Literacy And Studies in Schools (CLASS) Project was initially introduced as a pilot. A total of 12,000 computers were then distributed to secondary (Class X) and senior secondary schools (Class XII) through State Governments. The project was subsequently adopted as a Centrally Sponsored Scheme during the 7<sup>th</sup> Plan (1993-98). During the 8<sup>th</sup> Five Year Plan the Scheme was widened to provide financial grants to institutions which were earlier given computers and also to cover new Government Aided Secondary/Senior Secondary Schools. Assistance included annual maintenance grant and purchase of equipment for new Schools. A total of 2598 schools were covered during this period.

In July 1998 the Prime Minister constituted a National Task Force on Information Technology and Software Development (IT Task Force) – which made specific recommendations on introduction of I.T. in the education sector including schools. The relevant paragraphs are reproduced below:

Vidyarthi Computer Scheme, Shikshak Computer Scheme and School Computer Scheme to enable students, teachers or schools respectively, desirous of buying computers to do so under attractive financial packages. These schemes will be supported by a suite of initiatives such as lowering the cost of PCs, easy installment bank loans, computer donations by IT companies and other business houses, bulk donations of computers by NRI organizations, large-volume bargain price imports, multi-lateral funding, etc.

Computers and Internet shall be made accessible to schools, polytechnics, colleges, and public hospitals in the country by the year 2003.

The concept of SMART Schools where the emphasis is not only on Information Technology in Schools, but also on the use of skills and values that will be important in the next millennium, shall be started on a pilot demonstrative basis in each State.

The Report recommended provision of computer systems to all educational Institutions upto Higher Secondary/Secondary Schools by suitable: investments (about 1-3%) of the total budget during the next five years.

The recommendations of the Task Force were accepted by the Council of Ministers.

Based on the recommendations of the Task Force and the advice of the Planning Commission a revised CLASS scheme was introduced in the year 2001-2002. During the financial year 2001-02 a provision of Rs.845 million was made for this purpose.

Based on the feedback received from the States and an evaluation study conducted by an independent agency the CLASS scheme has now been further modified and greater flexibility introduced. The new scheme has been christened 'ICT @ Schools'. The main features of the revised scheme are given in '**Annexure I**'.

The 'ICT @ Schools' scheme is a window of opportunity to the learners in the schools of India to bridge the digital divide. The scheme is not a simple merger of the earlier CLASS and ET Schemes but is a comprehensive and well thought-out initiative to open new vistas of learning and to provide a level playing field to school students, whether in rural areas or in the metropolitan cities. The Scheme is not a stand-alone one but actively solicits the partnership of States, Union Territories & other organizations in a mutual endeavour to bridge the heterogeneous proliferation of ICT across different socio-economic and geographic segments in the country. This partnership is manifest in the structure of financing the initiative, in encouraging the development of long-term Computer Education Plans, the setting-up of Smart Schools by KVS/NVS in States as technology demonstrators and in providing for supplementing

the States efforts in these areas with no attempt being made to supplant the State Schemes.

India is a federal country with the subject of education featured in the concurrent list of the Constitution, thereby making both the Union and the States' responsible for it. Several States have therefore initiated their own projects for providing ICT enabled education in schools. Some of the more prominent initiatives are:-

### **1. MAHITHI SINDHU**

Mahithi Sindhu is a computer Education Programme for the students of the Government Secondary Schools of Karnataka. The objective of the Government is to provide computer and computer aided education under Mahithi Sindhu "Free of Cost". While selecting schools importance has been given to those with girl students in rural areas, Schedule Castes (SC) and Schedule Tribes (ST) and backward classes.

The goal of this massive programme "Mahithi Sindhu" is to provide computer and computer aided education to the students of atleast one government secondary school in each of the Revenue hobli (administrative division), Morarji and Navodaya (special schools) residential schools run by the social welfare and backward class departments and thereby to enhance the quality of education for the most deprived.

#### Objectives of the Project

- To enable the students to gain computer education and to understand its applications.
- To enhance the learning levels of the students in curricular subjects through computer aided education.
- To introduce students to the world of opportunities ICT have to offer.
- To enable students to understand the basics of computer programming.

- To introduce students to the communication media of E-mail and Internet.
- To establish Mahithi Sindhu Schools as computer training centers outside school hours to train rural youth in the use of computers.
- To provide opportunities to the entire community also to use computers.

The Special Features of Mahithi Sindhu are

- The Mahithi Sindhu programme is being implemented in 1000 government high schools of the State.
- It is for students of classes 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup>.
- In addition to Computer Education, students through CD ROMs learn Science, Social science, English and Mathematics.
- Students are given hands-on experience in E-mail and Internet surfing.
- Students have the option of learning through either English or Kannada (the regional language) medium.
- Four classes are set apart in a week for ICT and computer aided education.
- Teachers of selected schools are provided training during the project period.

## Mode of Implementation

The project is being implemented through 3 private companies. They are (1) NIIT (2) APTECH and (3) EDUCOMP. The period of implementation of the project is for 5 years on a turnkey basis.

The No. of computers provided to each school is based on the strength of the school in the following manner:

Category	Students strength	No. of computers
A	upto 150	1 server and 5 workstations
B	151 to 250	1 server and 9 workstations
C	251 & above	1 server and 14 workstations

The responsibilities of the Companies, the obligation of the Government & Financial Management of the project are detailed in '**Annexure II**'

## Supervision and monitoring

Mahithi Sindhu is being implemented by Department of State Educational Research & Training (DSERT). Monitoring and supervision is done through District Institutes of Education & Training (DIETs) as nodal agencies.

An Evaluation will finally be done through Indian Institute of Science, Bangalore and Computer Science Departments of the Engineering Colleges of the state.

## **2. RAJIV GANDHI COMPUTER LITERACY PROGRAMME (RGCLP)**

RGCLP – a unique educational venture with private sector participation, is intended to carry forward the vision to “build a computer literate Assam”. The Government of Assam has initiated the Rajiv Gandhi Computer Literacy Programme to

impart ICT education in the State's Government schools. The Planning and Development Department and AMTRON, the State Nodal Agency for Information Technology have embarked on this ambitious project of providing computer education, free of cost, to the students of the Government Higher Secondary Schools. In pursuance thereof, AMTRON has entered into a strategic tie up with NIIT & CMC, leaders in the field of Computer Education, to achieve the highest level of excellence in the project. It is envisaged to enhance the scope of this project to cover 600 schools in the future.

The details of Computer Hardware, Software and accessories installed in each school is given in '**Annexure – III**'.

The total cost of the project is Rs.123 Crores

Syllabus – a sampling: Computer Overview, Operating Systems, WINDOWS-2003, Paint, Presentation Graphics, Word processing, Computer Maintenance, Internet, Electronic Spreadsheet, HTML, Programming Logic and Techniques (PLT), Qbasic, Programming in C/C++, JAVA, Object Oriented Programming, Graphics, Visual Basic, Application Projects, Visual Basic Events

Faculty: The associates provide two faculty members with minimum qualification being graduation with a post-graduate diploma in computer applications/DOEACC 'A' level or equivalent from reputed institutions.

Supervision and Monitoring :

There is a 3 tier monitoring system.

Day-to-day activities at each school is to be monitored by the Principal/Head Master of the School and the School Teacher(s) appointed by the agency. There is a District/School Coordinator provided by the Agency for a group of ten schools. The role of the School/District Coordinator is to assist the District Level Committee.

District Level Committee: Monitoring Authority of the project is AMTRON through a District Level Committee appointed by the Government of Assam for monitoring the progress and status of the project in each district.

State level Committee: AMTRON is to communicate Quarterly Progress Report to the State Level Committee of the Government. The committee meets on a quarterly basis.

Project Review: In addition to the above, it is proposed that AMTRON shall independently empanel eminent Academicians and Experts to review the performance of the project.

#### Special features of the Rajiv Gandhi Computer Literacy Programme

- School stage : Secondary
- Classes covered: V-XII
- Students not to pay fee
- Course material to be supplied to the students
- Tests & exams to be held
- BOT Process
- 5 Year maintenance inbuilt
- Stress on performance & results
- Computer Aided Education in 4 subjects viz. English, Maths, Science & Social Science.
- Multimedia Educational Software
- Spoken English Course
- Testing & Certification in Computer Education at the end of every academic year.

In the first phase the Programme has:

- Equipped 400 schools with state-of-the-art computer laboratories
- Run by more than 800 computer professionals
- Equipped 400 schools with eco-friendly sound proof generator sets

- Another 230 schools have been identified for the 3<sup>rd</sup> Phase

### **3. HEADSTART**

The Rajiv Gandhi Shiksha Mission in Madhya Pradesh, apart from its other innovative activities, has also endeavored to use Information and Communication Technology for improving the quality of teaching learning processes. This has been done through its computer-enabled education programme – Headstart. Under Headstart, a unit of three computers with UPS and printer is provided at the nodal school called Jan Shiksha Kendra covering a cluster of schools. The distinctive feature of Headstart is the development of customized culturally familiar educational software in Hindi, Mathematics, Environmental Studies and English designed to be used by the children. These multi-media rich lessons aim at strengthening learning competencies and expanding the knowledge base of students and teachers and develop computer literacy along with it. Headstart centers are functional through convergence of resources and are running successfully. Teachers are being trained for 10 days on the use of multi-media rich lessons for developing desired competencies of learners. The training also focuses on software so that teachers are able to develop their own lessons & activities with the help of children.

2718 Headstart centers have been sanctioned so far and other 541 new Headstart centers are proposed under the innovation head. The proposal for Headstart includes provision of hardware, software, training, insurance, annual maintenance contract for the procured hardware and contingency expenses for consumables etc.

As the foregoing account shows several attempts have been made to integrate ICT in education in India. Many of these efforts are now more than two decades old. However, certain issues and concerns remain unattended and need to be addressed. These include

#### 1) The Policy Framework:-

The National Policy of Education was formulated in the year 1986. An Action Plan to implement the policy came out in the year 1992. Far reaching changes have

taken place in the environment since then and there is an urgent need to recast and refocus the policy. The 1986 policy dealt with the issue of ICT in the framework of reorienting the content and process of education (part VIII). The relevant extract is annexed at '**Annexure – IV**'. It stated that "computers have become important and ubiquitous tools, a minimal exposure to computers and a training in their use will form part of professional education. Programmes of computer literacy will be organized on a wide scale from the school stage". The Programme of Action based on the National Policy resolved that computer applications with adequate facilities of computers in schools would be encouraged on operation basis at secondary and higher secondary levels. Interestingly several States have formulated policies on ICT use for their respective regions though the National Government is yet to do so.

## 2) Infrastructure:-

The ICT infrastructure in the country is woefully inadequate. While the tele-density is a meagre 8.2, the availability of computers in the country is about 11:1000. While the market for PCs is growing, the number of computers sold every year still remains in the range of 10 million. Most areas of the country do not have Internet Connectivity and the only way to provide widespread connectivity seems to be through V-SATs which are a capital intensive proposition. The State owned telecommunication companies MTNL and BSNL have recently announced their plans for a broadband initiative. While no comprehensive study is available on the availability of ICT at the school level it can be safely assumed that in the given scenario the situation needs improvement.

## 3) Availability of Quality Content:-

While provision of hardware is still possible provided funds are available, it is the provision of educational content which becomes a major determinant of success or failure of such a programme. A large proportion of educational content being generated by private companies in the country is sub-standard. For one, it is only an

attempt to digitize the current text books and for another it does not attempt to utilize the capacity of computers to encourage creative thinking or a spirit of enquiry. Most of the content currently available only re-enforces memory-based learning. Another important issue is that of availability of digitized content in local languages.

#### 4) Teachers' Training:-

Training of teachers is part of the triad which determines the success of integration of technology into education. In a situation where training of teachers itself is a big issue specially the aspect of in-service training, training for specialized purposes like integration of technology is expectedly inadequate. Multi-nationals like INTEL, Microsoft and even IBM have made the most significant and focused efforts. INTEL has trained a total of 411,800 teachers till March 2005 through its project 'Teach the Future'. Microsoft's project 'Shiksha' is active in the Northern State of Uttaranchal, while IBM is partnering the Eastern State of West Bengal. The issue in training of teachers is not only confined to numbers but also the quality and content of it. Many of these programmes have limited themselves in providing training on certain software applications only.

#### 5) Management:-

While most countries have established specific agencies to deal with the important issue of integrating technology into education, India still does not have any such Organisation. Most of the programmes are being implemented through Government Departments whether in the Union Government or in the States. The result is a lack of focus as officials are burdened with several other programmes and initiatives of the Government. The success of UK's British Educational Communication & Technology Agency (BECTA), Canada's Schoolnet and Australia's EdNA needs to be replicated.

## 6) Curriculum and Material Development:-

India's National Council of Educational Research and Training (NCERT) has formulated a curriculum for ICT education. However, the same needs to be disseminated on a wider scale as a lack of awareness of the existence of such a curriculum is encouraging other players to reinvent the wheel. This obviously means a duplicacy of efforts. Similarly, the availability of good quality educational content remains a problem as mentioned in the earlier section. Perhaps there is a need to replicate with suitable modifications, quality educational content available in other countries which is not culture or region specific.

## 7) Dualism in Access:-

One of the most important issues in education in general and the provision of ICT in particular is the lack of access to such facilities by rural children and those belonging to disadvantaged backgrounds including backward communities, minorities and girls. While schools in urban areas are resource rich and are able to provide the hardware necessary for ICT, it is the rural schools which are at a disadvantage. The irony is that a majority of India's children go to rural Government schools and it is these which lack resources the most.

It is in this background that UNESCO decided to commission a pilot project on testing of Performance Indicators for ICT in Education.

This is a part of the JFIT-funded ICT in Education project and offers the mechanism for measuring the impact of the use of ICT in education in Asian and Pacific countries. This region has recently embarked on the widespread use of ICT in education. As the presence and use of ICT become increasingly widespread, schools, universities and other learning places will need to develop performance indicators to monitor the use and outcomes of technologies and to demonstrate accountability to funding sources and the public. These indicators are needed to show the relationship between technology use and educational reforms, empowerment of teachers, changes

in teaching and learning processes, and student learning. There is a need to show that education should be seen as using technology not only as an end in itself, but as a means to promote creativity, empowerment and equality and produce efficient learners and problem solvers.

To be able to assess such a relationship, appropriate measurement tools are needed. The development of a structure of indicators as a means of gauging the level of change towards the formation of a learning and knowledge society is the objective of this project. Several issues need to be carefully explored: (a) the development of indicators which can represent both quantitative and qualitative improvements in education as a result of ICT use; (b) the measurement of ICT usage with a focus on equity which refers to widespread and equal access to ICT (e.g., between gender; between and within countries); and (c) methods of collecting data on the selected indicators.

An initial assessment of the indicators already developed by others shows their largely quantitative nature. While data that can be collected from these indicators can provide an overall view of infrastructure support and ICT penetration, this component strives to examine more closely indicators that will show how ICTs have been used not only as a basic operational tool but also as a communications tool which promotes the development of creativity, interactivity, collaborative learning, critical thinking and problem-solving. Eventually, educational policy makers and administrators should mainstream the use of these indicators into their national educational policies and management information systems. This project does not stop at indicators construction but will guide policy makers to put indicators to work. And to put indicators to work, they need to be considered as a stimulus for change, rather than only a snapshot of current conditions.

The JFIT project has developed a structure of indicators to measure ICT use in education and provides a basis for policy planning and programme improvements, specifically demonstrating how ICTs are raising standards in education, serving as a

catalyst for change. The project implements the following strategies: (i) undertaking a situational analysis in order to examine existing projects/activities implemented within and outside the region in measuring the impact of the use of ICT in education and on this basis, identifying an appropriate set of performance indicators which could be adapted or developed for application in the region; (ii) pilot testing this set of indicators in selected countries; (iii) developing a systematic mechanism and database for the collection, storage, analysis, and dissemination of the indicators based on a network of regional, sub-regional and national focal centers; (iv) promoting data utilization and undertaking advocacy work to convince educational policy makers and administrators to mainstream the collection and maintenance of indicators into their national educational policies and management information systems; (v) building national capacity in the collection, processing and dissemination of indicators; and (vi) implementing an information repackaging programme which will ensure that the results/data collected dealing with these indicators are disseminated and utilized for policy and programme adjustments and improvements.

\*\*\*\*\*

## **CHAPTER – II**

### **OBJECTIVES, RATIONALE & ASSUMPTIONS**

#### **Objectives**

The overall objective of the JFIT – funded ICT in Education project was to develop a set of core indicators to assess the impact of ICT in education. More specific objectives include the following:

1. To provide an understanding of how selected countries use computers in schools and of efforts in measuring the effects of ICT use in education.
1. Present a regional situational analysis synthesizing experience and lessons learned in the use of ICT indicators in Asia and the Pacific.
2. Share the experiences and initiatives from other regions (e.g. Europe, Baltic and CIS countries) to measure the impact of ICT in education; the set of indicators learned and implications of their experiences to Asia and the Pacific
3. Recommend a set of indicators for measuring ICT use in education in Asia and the Pacific, including a rationale for each and methods of data collection and use
5. Recommend methods/mechanisms for pre-testing and data collection, procession, storage and dissemination.

Basically, the data collected is based on a set of performance indicators which have been formulated by UNESCO Bangkok & which are grouped into five components, namely:

- Component 1. ICT Based Policy and strategy
- Component 2. ICT infrastructure and Access
- Component 3. Curriculum and textbooks
- Component 4. Teaching Professionals use and Teaching
- Component 5. Student use and learning

The Indian survey largely adopted the indicators proposed by UNESCO and modified them to Indian conditions. Basically, these ICT indicators evaluated the following in their survey of schools, teachers and students:

### **Indicators to evaluate ICT use in schools:**

4. Access to telecommunication facilities
5. Access to ICTs and related ICTs
6. Use of ICTs for education vis-à-vis administrative use
7. Hardware used (CD Drive, operating system)
8. Connectivity (networked, Internet connection, kinds of Internet connection, have website, have E-mail)
9. Software (applications for word processing, spreadsheets, database, graphics, presentation, educational software, etc.)
10. Presence of ICT unit, coordinator, master plan and budget
11. Use of computers by number of teachers and students
12. Frequency of use of computers for teaching/learning
13. Frequency of computer use for various purposes
14. Number of teachers trained at both pre-service and in-service level
15. Number of hours spent for using computers, Internet and computer lab
16. Number of hours used for teaching about computers as a separate subject; for using it as integrated into teaching specific subjects and special programme

### **Indicators to evaluate utilization of ICT by Teachers**

1. Percentage of teachers who have received training in the last three years
2. Level of ICT training (basic, intermediate, advance) percentage of teachers trained by levels of training (as against the total number of teachers)
3. Access to ICTs- ICTs personal ownership
4. ICTs used in school
5. Frequency of use of ICTs
6. Access to ICTs –location, inside and outside of schools

7. Levels of skills/expertise in use of ICTs, Level of expertise in the use of ICT (percentage of teachers who use computers by level of expertise for each use)
8. Purpose of use of computers for teaching and frequency (percentage of teachers who use computers by purposes of use and frequency of use)
9. Subjects for which ICTs is used

### **Indicators to evaluate ICT use by students**

1. Access to computers at home
2. Access to computers in school and frequency of use
3. Location of computers
4. Number of hours of computer use in various locations
5. Number of hours of Internet use in various locations
6. Number of students with ICT access outside of schools and in various locations
7. Level of skills/expertise in using computers
8. Source of learning of computers
9. Subjects for which computers are used
10. Percentage of students who are using computers for various purposes and degree of use
11. Fee charged for use of computers

### **Indicators to evaluate ICT-based Policy and Strategy**

1. Existence of National/sub-national policy on ICT in education
4. Existence of Master plan with a time frame
5. Quantum of Budget appropriated for ICT
6. Organisational structure in charge of ICT for education
7. Scope and level of ICT programme
8. Monitoring and evaluation mechanism
9. Statement of inclusion of women, minorities and those with special needs
8. Existence of technology plan in schools

## **Rationale**

Though computers came to Indian classrooms in the year 1984-85 the level of adoption of modern technology in the teaching and learning process has been limited and uneven. There has been no comprehensive study or survey on the use of ICT in schools. This study not only provides a snap-shot of the situation on the ground but shall also be a bench mark for further studies in this area. The results of the study shall act as a catalyst for change and also provide a road map.

The Government of India has laid due emphasis on the use of technology in education. The results of such efforts are yet to be fully seen. However this does not mean that there is no need for mid-term evaluation and correction. Success or results can be measured at points along the way in addition to the impact ICT will make at the end of the programme. Determining whether one is on the right track can be ensured through indicators of criteria against which the results can be verified. .

Problem of access has been a recurring feature of the educational landscape of the country. This issue has become even more important with the introduction of ICT in schools. While students of schools in the urban areas and those in the private sector have access to the latest technological tools, those in the rural areas and in the State sector are at a disadvantageous position. This is the problem of the “digital divide” and the results of this study shall help in identifying the areas of focus and action.

Performance indicators, which were, tested during the course of the study show the relationships between technology use and educational reforms, empowerment of teachers, deficiencies in the teaching and learning processes and student learning. There is a need to show that education should be seen as using technology not only as an end in itself but as a means to promote creativity, empowerment and equality and produce efficient learners and problem solvers. Indicators need to be considered as a stimulus to change rather than only a snapshot of current conditions.

This study shall promote utilization of data connected with ICT in education and undertaking advocacy work to convince education policy-makers and administrators to mainstream the collection and maintenance of indicators into their State educational policies and management information systems. In India the specific objectives of the study were:-

### Objectives

1. To monitor and evaluate the use and outcomes of ICT in education in India in order to provide benchmarks for policy and programme improvements.
2. To show the relationship between technology use and changes in teaching and learning process, as well as educational curricular improvements
3. To pilot test a set of indicators developed by UNESCO Bangkok in collaboration with selected countries in Asia.

While testing the performance indicators & studying the use & impact of ICT in education, the following assumptions were made

### **Hypothesis Made:-**

- i) Lack of policy on ICT in education and a coordinating/implementing unit has negatively affected the implementation of ICT in education
- ii) Lack of budgets has adversely affected the adequate equipping of schools with hardware and software
- iii) Most of the budget is being used for purchasing ICT hardware rather than supporting teacher's training and curriculum development
- iv) Most of the ICT is concentrated in the cities, among boys, and does not reach the disadvantaged groups
- v) Short teacher training programmes have not developed adequate knowledge and skills of teachers in the use of ICT in schools

- vi) There is minimal use of ICT as a tool for teaching specific subjects. Instead, the topic ICT is mostly taught as a separate subject
- vii) Lack of access to computer facilities after school hours has hampered the effective use of ICT in teaching and learning
- viii) Lack of Internet connectivity has demotivated teachers and students to use it for teaching and learning
- ix) Computers are mostly being used for making presentations or documents but not for developing critical thinking.
- x) As most teachers had been trained in basic ICT, they cannot use computers for creative and productive work in teaching of specific subjects
- xi) As students have very minimal access to computers outside the schools, the use of computers have not helped them in accomplishing their homework.
- xii) Students in government schools are in a disadvantageous position compared to private schools because of a lack of ICT infrastructure, which has resulted in lower usage of ICT in these schools.

\*\*\*\*\*

## **CHAPTER – III**

### **METHODOLOGY**

The pilot testing employed the following methodologies in collecting data:

1. Review and analysis of records, files and documents
1. Survey using questionnaire
2. Interview of key informants

#### **A. Review and analysis of records, files and documents**

This method of data collection was basically used in obtaining information dealing with all indicators on 'ICT-Based policy and strategy' component. This information was available at the Ministry of Human Resource Development, Government of India and the respective Education Departments of the two States of Gujarat and Karnataka.

#### **B. Survey Questionnaires**

The survey questionnaire was used for collecting data from schools, teachers and students. Thus, three sets of questionnaires have been developed & utilised:

1. Head of School questionnaire
2. Teachers' questionnaire.
3. Students' questionnaire.

The questionnaires are attached at '**Annexure – V, VI & VII**'.

#### **C. Sample size and sampling method**

In view of the large size of the country and the fact that the number of primary & secondary schools run into hundreds of thousands, two representative States were selected – Gujarat in Western India and Karnataka in South India. Again, two Districts in two different areas of the State were selected for the Pilot project. Schools in the

capital cities of the two States were also surveyed to reflect the different stages of development in the use of ICT in teaching and learning.

The survey used multistage random sampling and the sample unit was the school. The random steps were:-

- Step 1 - From each of the Districts two hundred schools – 100 Primary and 100 Secondary schools were selected. This resulted in 800 sample schools in the 4 Districts of the 2 States. Total sample schools at this stage were 800 schools.
- Step 2 - From each of the capital cities of the two States, 100 schools were selected, out of which 50 were primary and 50 were secondary schools. Total sample schools at this stage were 1000.
- Step 3 - For each school, all 1000 Heads of school or school administrators were included in the sample as respondents to the school questionnaire as well as all teachers in the 1000 schools were included in the survey (about 05-15 teachers per school).
- Step 4 - The students survey followed cluster sampling by first selecting primary and secondary levels and in each level, one class was selected for sampling. The total of students' sample size was based on the size of the classroom. (about 20-40 students per classroom).
- Step 5 - This methodology produced the following sample size:
  - Number of schools : 1000.
  - Number of teachers : 6570.
  - Number of students : 35,547.

## **Data Collection:**

The survey took place in the early part of 2004. The data collection process was as follows:

1. Pre-testing of questionnaires and revision as necessary
2. Invite the officers of the District Education Office & volunteers to a meeting, explain the process of ICT pilot testing and train them on how to undertake data collection. The officials of the local National Informatics Centre (NIC) were trained and assisted in the process of data tabulation.
3. Data was collected from the field
4. An independent agency did data tabulation and processing.
5. Research committee inspected data collection in the field.
6. Further validation of data was made & wherever necessary cross-checking was done.
7. Revision of data, analysis and preparation of report.

\*\*\*\*\*

## CHAPTER – IV

### FINDINGS

As mentioned, the methodology utilized in the collection of data for the pilot testing was administering a set of questionnaire to Heads of schools, Teachers & Students. The data generated from the survey has been analysed separately for each. The survey took place in the early part of 2004. The findings are given below. Care has been taken to retain the same number for the Tables/Graphs as that of the Question in the relevant Questionnaire for easy comprehension & comparison.

#### **I. HEADS OF SCHOOL**

Table: H 5.1 shows that out of the 1,000 schools surveyed 500 each were in the States of Gujarat in the West and Karnataka in the South of the Country. Out of these 500 schools, 200 each were in the Districts of Patan and Surendranagar in Gujarat and Bellary and Mandya in Karnataka. 100 schools each were also surveyed in the capital cities of Ahmedabad in Gujarat and Bangalore in Karnataka. In Gujarat, the ratio of the number of urban schools to rural ones was 26:65.8 and in Karnataka it was 37.6:53.6. There were thus more rural schools surveyed in Gujarat. The maximum number of such schools were in Surendranagar while the maximum number of urban schools were in Ahmedabad at 96%. Out of the 1,000 schools 59.7% were rural and 31.8% were urban.

**Table : H 5.1**  
**Area wise Distribution of Schools**

District/State	Urban		Semi-urban		Rural		Total	
	N	%	N	%	N	%	N	%
Ahmedabad	96	96.0	1	1.0	3	3.0	100	100.0
Patan	32	16.0	8	4.0	160	80.0	200	100.0
Surendranagar	2	1.0	32	16.0	166	83.0	200	100.0
<b>Gujarat</b>	<b>130</b>	<b>26.0</b>	<b>41</b>	<b>8.2</b>	<b>329</b>	<b>65.8</b>	<b>500</b>	<b>100.0</b>
Bangalore	79	79.0	12	12.0	9	9.0	100	100.0
Bellary	62	31.0	12	6.0	126	63.0	200	100.0
Mandya	47	23.5	20	10.0	133	66.5	200	100.0
<b>Karnataka</b>	<b>188</b>	<b>37.6</b>	<b>44</b>	<b>8.8</b>	<b>268</b>	<b>53.6</b>	<b>500</b>	<b>100.0</b>
<b>Total</b>	<b>318</b>	<b>31.8</b>	<b>85</b>	<b>8.5</b>	<b>597</b>	<b>59.7</b>	<b>1000</b>	<b>100.0</b>

A majority of the schools surveyed in both the States were Government or Public Schools. Out of the 1,000 schools, 602 (60.2%) were Government Schools and 398 (39.8%) were Private Schools. There were more Government Schools at 66.2% in the sample of the State of Karnataka.

**Table : H 6.1  
Management of Schools**

District/State	Government/Public		Private	
	N	%	N	%
Ahmedabad	31	31.0	69	69.0
Patan	118	59.0	82	41.0
Surendranagar	122	61.0	78	39.0
<b>Gujarat</b>	<b>271</b>	<b>54.2</b>	<b>229</b>	<b>45.8</b>
Bangalore	51	51.0	49	49.0
Bellary	123	61.5	77	38.5
Mandya	157	78.5	43	21.5
<b>Karnataka</b>	<b>331</b>	<b>66.2</b>	<b>169</b>	<b>33.8</b>
<b>Total</b>	602	60.2	398	39.8

The ratio of Primary to Secondary Schools was approximately equal. Out of the total 1,000 schools, 49.7% were primary and 51.3% were secondary. The relevant ratios for Gujarat were 50.8% Primary Schools and 49.2% Secondary Schools while Karnataka had 48.6% Primary Schools and 51.4% Secondary Schools in the sample.

**Table : H 7.1  
Academic Level of Schools**

District/State	Primary		Secondary	
	N	%	N	%
Ahmedabad	46	9.2	54	10.8
Patan	97	19.4	103	20.6
Surendranagar	111	22.2	89	17.8
<b>Gujarat</b>	<b>254</b>	<b>50.8</b>	<b>246</b>	<b>49.2</b>
Bangalore	42	8.4	58	11.6
Bellary	100	20	100	20
Mandya	101	20.2	99	19.8
<b>Karnataka</b>	<b>243</b>	<b>48.6</b>	<b>257</b>	<b>51.4</b>
<b>Total</b>	497	49.7	503	50.3

The total number of students enrolled in these 1,000 schools were 2,24,018. Out of these 1,21,029 were from Gujarat and 1,02,989 were from Karnataka. The total number of boys in these 1,000 schools were 1,25,714 while the number of girls were substantially less at 98,304. Further details are depicted in Table: H 8.1

**Table : H 8.1  
Gender Distribution of Students**

District/State	Boys			Girls			Total Students
	Primary	Secondary	Total	Primary	Secondary	Total	
Ahmedabad	11895	12719	24614	9046	8563	17609	42223
Patan	14678	20638	35316	10201	12044	22245	57561
Surendranagar	11414	1285	12699	7918	628	8546	21245
<b>Gujarat</b>	<b>37987</b>	<b>34642</b>	<b>72629</b>	<b>27165</b>	<b>21235</b>	<b>48400</b>	<b>121029</b>
Bangalore	7859	6201	14060	7314	6329	13643	27703
Bellary	6854	12561	19415	5954	10560	16514	35929
Mandya	9068	10542	19610	8679	11068	19747	39357
<b>Karnataka</b>	<b>23781</b>	<b>29304</b>	<b>53085</b>	<b>21947</b>	<b>27957</b>	<b>49904</b>	<b>102989</b>
<b>Total</b>	<b>61768</b>	<b>63946</b>	<b>125714</b>	<b>49112</b>	<b>49192</b>	<b>98304</b>	<b>224018</b>

The total number of staff members in these schools were 10,777. Out of these teaching staff comprised were 7,963, non teaching staff were 1,631 and administrative staff were 1,183. Karnataka schools had not only lesser number of teaching staff, the number of non-teaching and administrative staff were also less than Gujarat. The relevant details are provided in Table: H 9.1

**Table : H 9.1  
Teaching & Non-Teaching Staff of Schools**

District/State	Teaching Staff			Non-Teaching Staff			Administrative Staff		
	Primary	Secondary	Total	Primary	Secondary	Total	Primary	Secondary	Total
Ahmedabad	610	798	1408	50	269	319	30	67	97
Patan	974	1034	2008	97	409	506	142	251	393
Surendranagar	604	532	1136	4	148	152	94	184	278
<b>Gujarat</b>	<b>2188</b>	<b>2364</b>	<b>4552</b>	<b>151</b>	<b>826</b>	<b>977</b>	<b>266</b>	<b>502</b>	<b>768</b>
Bangalore	410	506	916	30	141	171	43	50	93
Bellary	639	764	1403	51	276	327	86	88	174
Mandya	506	586	1092	7	149	156	56	92	148
<b>Karnataka</b>	<b>1555</b>	<b>1856</b>	<b>3411</b>	<b>88</b>	<b>566</b>	<b>654</b>	<b>185</b>	<b>230</b>	<b>415</b>
<b>Total</b>	<b>3743</b>	<b>4220</b>	<b>7963</b>	<b>239</b>	<b>1392</b>	<b>1631</b>	<b>451</b>	<b>732</b>	<b>1183</b>

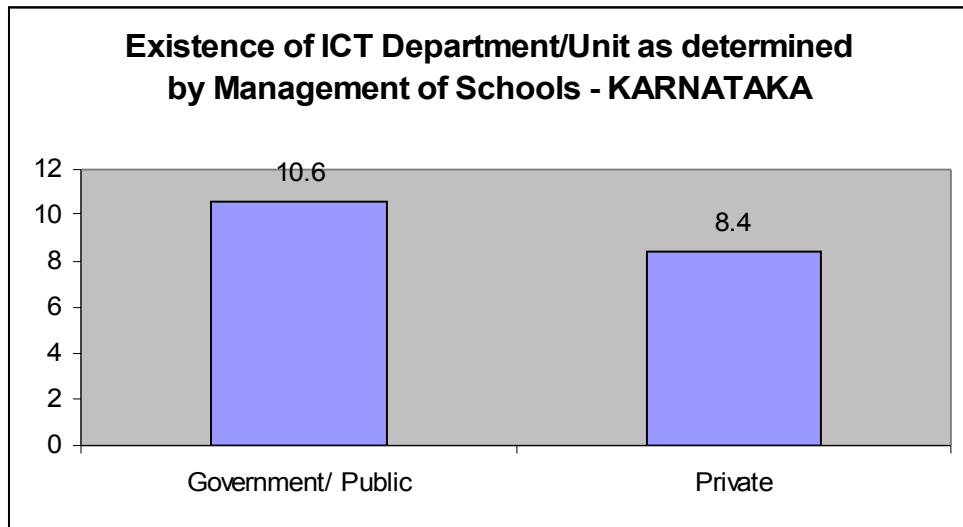
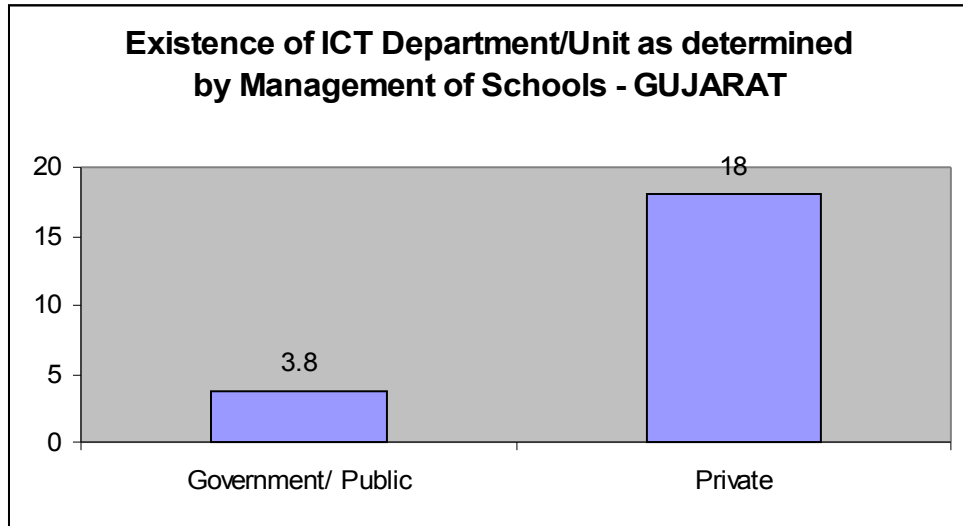
Coming to the specifics of the survey, the respondents were asked about the presence of an ICT Department or Unit in their schools. While the details are given in the Table below it was interesting to know that only 20.4% of the total number of schools had such a provision. While more number of Gujarat schools had an ICT Department, the variation between the State specially between urban and rural areas was sharp. This was not true for the State of Karnataka. A cursory glance would show that while 37% of Ahmedabad schools had an ICT Department or Unit only 6% were similarly placed in Surendranagar District. However, in Bangalore while 33% of the schools had such facilities only 13.5% had them in Mandya.

**Table : H 10.1**  
**Existence of ICT Department/Unit in Schools**

<b>District/State</b>	<b>Urban</b>	<b>Semi-urban</b>	<b>Rural</b>	<b>Total</b>
Ahmedabad	37.0	0.0	0.0	37.0
Patan	8.5	1.5	20.0	30.0
Surendranagar	0.0	5.0	1.0	6.0
<b>Gujarat</b>	<b>10.8</b>	<b>2.6</b>	<b>8.4</b>	<b>21.8</b>
Bangalore	25.0	8.0	0.0	33.0
Bellary	6.50	2.0	9.0	17.5
Mandya	3.5	1.5	8.5	13.5
<b>Karnataka</b>	<b>9.0</b>	<b>3.0</b>	<b>7.0</b>	<b>19.0</b>
<b>Total</b>	<b>9.9</b>	<b>2.8</b>	<b>7.7</b>	<b>20.4</b>

A comparison of Private and Government Schools in this respect showed that more Private Schools (13.2%) had ICT facilities only. 7.2% of Government Schools had such a provision. In Gujarat this dichotomy was even more pronounced where 18% Private Schools had ICT facilities compared to only 3.8% Government Schools. Surprisingly, in Karnataka more Government Schools (10.6%) had an ICT Department compared to Private Schools (8.4%). This was specially true of rural Karnataka. One may, therefore, assume that Government Schools in the rural areas of Karnataka are better endowed than their private counter-parts at least in this respect.

**Figure : H 10.2**



Predictably, many more Secondary Schools had ICT Departments than Primary Schools. Of the 1,000 schools 35.6% Secondary Schools had an ICT Department while only 5% of the Primary Schools had one.

**Table : H 10.3**  
**Existence of ICT Department/Unit according to**  
**Academic Level of Schools**

<b>District/State</b>	<b>Primary</b>	<b>Secondary</b>
Ahmedabad	7.0	30.0
Patan	0.5	29.5
Surendranagar	1.0	5.0
<b>Gujarat</b>	<b>2.0</b>	<b>19.8</b>
Bangalore	6.0	27.0
Bellary	3.0	14.5
Mandya	1.5	12.0
<b>Karnataka</b>	<b>3.0</b>	<b>16.0</b>
<b>Total</b>	<b>5.0</b>	<b>35.6</b>

It is said that installing hardware is one of the easiest components of an ICT package to implement. Without trained personnel, however, the hardware is of little use. We found that only 13.7% of the schools had an ICT Coordinator which was as expected, less than the number of schools (20.4%) which had an ICT Department. Karnataka was better than Gujarat in this respect and Bangalore had the maximum number of schools with an ICT Coordinator at 23%. Surprisingly, the rural schools in both the capital cities did not have any ICT Coordinator. The District most disadvantageous in this respect was Surendranagar in Gujarat.

**Table : H 11.1**  
**Presence of ICT Coordinator in Schools**

	<b>Urban</b>	<b>Semi-urban</b>	<b>Rural</b>	<b>Total</b>
Ahmedabad	18.0	0.0	0.0	18.0
Patan	3.5	1.5	7.0	12.0
Surendranagar	0.0	4.5	0.5	5.0
<b>Gujarat</b>	<b>5.0</b>	<b>2.4</b>	<b>3.0</b>	<b>10.4</b>
Bangalore	23.0	6.0	0.0	29.0
Bellary	7.0	1.5	7.5	16.0
Mandya	3.0	1.5	7.5	12.0
<b>Karnataka</b>	<b>8.6</b>	<b>2.4</b>	<b>6.0</b>	<b>17.0</b>
<b>Total</b>	<b>6.8</b>	<b>2.4</b>	<b>4.5</b>	<b>13.7</b>

Comparing the presence of ICT Coordinators between Private and Government Schools one found that while more Private Schools had them in Gujarat there were more ICT Coordinators in the Government Schools of Karnataka.

**Table : H 11.2  
Existence of ICT Coordinator according to  
Management of Schools**

District/State	Government/Public	Private
Ahmedabad	2.0	16.0
Patan	4.0	8.0
Surendranagar	0.5	4.5
<b>Gujarat</b>	<b>2.2</b>	<b>8.2</b>
Bangalore	11.0	18.0
Bellary	9.5	6.5
Mandya	9.0	3.0
<b>Karnataka</b>	<b>9.6</b>	<b>7.4</b>
<b>Total</b>	<b>5.9</b>	<b>7.8</b>

In Gujarat only 2% of Primary Schools have an ICT

Department and an even lesser number (0.8%) have a Coordinator. In Karnataka too the situation is not very different. 3% of Primary Schools in Karnataka have an ICT Unit but only 2.4% have a Coordinator.

**Table : H 11.3  
Existence of ICT Coordinator according to  
Academic Level of Schools**

District/State	Primary	Secondary
Ahmedabad	3.0	15.0
Patan	0.0	12.0
Surendranagar	0.5	4.5
<b>Gujarat</b>	<b>0.8</b>	<b>9.6</b>
Bangalore	4.0	25.0
Bellary	3.0	13.0
Mandya	1.0	11.0
<b>Karnataka</b>	<b>2.4</b>	<b>14.6</b>
<b>Total</b>	<b>1.6</b>	<b>12.1</b>

Purchase of hardware, training of teachers, procurement of educational content, scheduling of classes etc. all have to be part of a master plan to ensure maximum

benefits. Very few schools had an ICT master plan in place. 11% of Karnataka schools & 4.6% of Gujarat schools claimed to have an ICT master plan. Not unexpectedly the number of such schools was less than the number which had an ICT Department or an ICT Coordinator. In the two States it was Bangalore which had the largest number of schools having an ICT master plan.

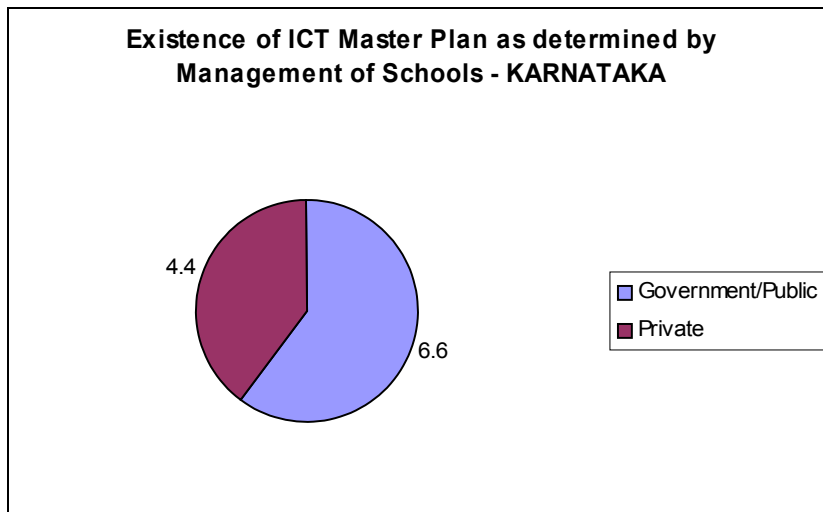
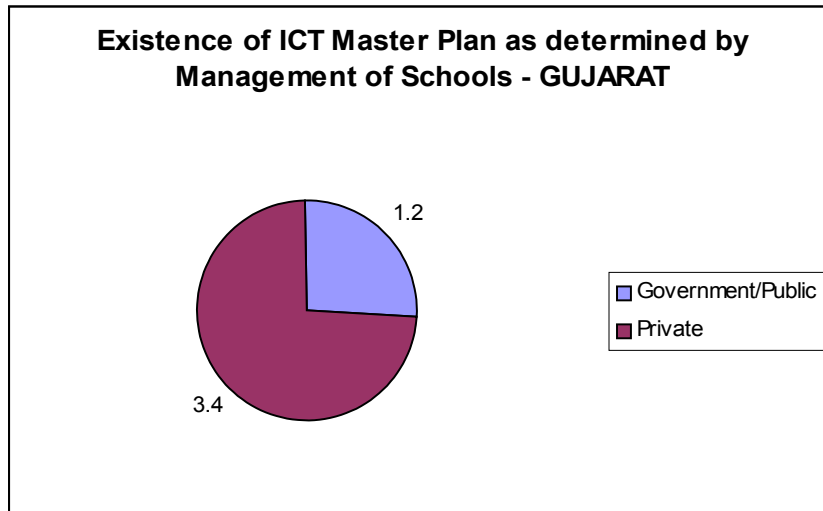
**Table : H 12.1  
ICT Master Plan in Schools**

<b>District/State</b>	<b>Urban</b>	<b>Semi-urban</b>	<b>Rural</b>	<b>Total</b>
Ahmedabad	5.0	0.0	0.0	5.0
Patan	0.5	0.5	4.5	5.5
Surendranagar	0.0	2.5	1.0	3.5
<b>Gujarat</b>	<b>1.2</b>	<b>1.2</b>	<b>2.2</b>	<b>4.6</b>
Bangalore	13.0	4.0	0.0	17.0
Bellary	2.0	0.5	6.5	9.0
Mandya	3.5	1.5	5.0	10.0
<b>Karnataka</b>	<b>4.8</b>	<b>1.6</b>	<b>4.6</b>	<b>11.0</b>
<b>Total</b>	<b>3.0</b>	<b>1.4</b>	<b>3.4</b>	<b>7.8</b>

**Table : H 12.2  
Existence of ICT Master Plan as determined by Management of Schools**

<b>District/State</b>	<b>Government/Public</b>	<b>Private</b>
Ahmedabad	0.0	5.0
Patan	2.5	3.0
Surendranagar	0.5	3.0
Bangalore	7.0	10.0
Bellary	6.5	2.5
Mandya	6.5	3.5
<b>Total</b>	<b>3.9</b>	<b>3.9</b>

**Figure : H 12.2**



As noticed earlier Gujarat and Karnataka reflected divergent trends when Private and Government Schools were compared. While more Private Schools in Gujarat had an ICT master plan more Government Schools in the rural areas of Karnataka had such a vision. What should be of concern is that no Government School in the capital city of Ahmedabad in Gujarat had a master plan and only half a percent of Government Schools in Surendranagar had formulated one.

**Table : H 12.3**  
**Existence of ICT Master Plan according to Academic Level of Schools**

<b>District/State</b>	<b>Primary</b>	<b>Secondary</b>
Ahmedabad	0.0	5.0
Patan	0.0	5.5
Surendranagar	0.0	3.5
<b>Gujarat</b>	<b>0.0</b>	<b>4.6</b>
Bangalore	4.0	13.0
Bellary	1.0	8.0
Mandya	2.0	8.0
<b>Karnataka</b>	<b>2.0</b>	<b>9.0</b>
<b>Total</b>	<b>1.0</b>	<b>6.8</b>

Availability of financial resources is generally one of the major constraints in integrating technology into education. Many of the ICT tools are expensive and sufficient resources are not available with schools. The Table below shows that the percentage of schools which had a budget for implementation of ICT was quite low. It was only marginally better in Gujarat compared to Karnataka. The maximum number of schools which reported the availability of a budget was in urban Ahmedabad. In many areas like urban Surendranagar, semi-urban Ahmedabad, rural Bangalore, semi-urban and rural Mandya no school reported availability of an independent budget with the administrative heads of schools.

**Table : H 14.1**  
**Budget for Implementation of ICT Plan in Schools**

<b>District/State</b>	<b>Urban</b>	<b>Semi-urban</b>	<b>Rural</b>	<b>Total</b>
Ahmedabad	14.0	0.0	1.0	15.0
Patan	2.0	1.0	4.5	7.5
Surendranagar	0.0	1.0	1.0	2.0
<b>Gujarat</b>	<b>3.6</b>	<b>0.8</b>	<b>2.4</b>	<b>6.8</b>
Bangalore	8.0	4.0	0.0	12.0
Bellary	2.5	0.5	4.5	7.5
Mandya	2.0	0.0	0.0	2.0
<b>Karnataka</b>	<b>3.4</b>	<b>1.0</b>	<b>1.8</b>	<b>6.2</b>
<b>Total</b>	<b>3.5</b>	<b>0.9</b>	<b>2.1</b>	<b>6.5</b>

More Private Schools had a separate budget than Government Schools. In fact all Government Schools in Ahmedabad and Surendranagar reported non-availability of resources. The maximum percentage of schools having a budget were the Private Schools in Ahmedabad. Interestingly, many more Government Schools in Karnataka (2.6%) had a separate budget for implementation of ICT than Government Schools in Gujarat (1.2%).

**Table : H 14.2**  
**Existence of Budget for Implementation of an ICT Plan as determined by Management of Schools**

<b>District/State</b>	<b>Government/Public</b>	<b>Private</b>
Ahmedabad	0.0	15.0
Patan	3.0	4.5
Surendranagar	0.0	2.0
<b>Gujarat</b>	<b>1.2</b>	<b>5.6</b>
Bangalore	4.0	8.0
Bellary	4.0	3.5
Mandya	0.5	1.5
<b>Karnataka</b>	<b>2.6</b>	<b>3.6</b>
<b>Total</b>	<b>1.9</b>	<b>4.7</b>

Practically, no Primary School had such a budget in the two States, Secondary Schools were better placed. A comparison between the two States showed that while Primary Schools in Karnataka were better than their counter-parts in Gujarat, the Secondary Schools in Gujarat were better placed.

**Table : H 14.3**  
**Existence of Budget for Implementation of ICT Plan as determined by Academic Level**

<b>District/State</b>	<b>Primary</b>	<b>Secondary</b>
Ahmedabad	1.0	14.0
Patan	0.0	7.5
Surendranagar	0.0	2.0
<b>Gujarat</b>	<b>0.2</b>	<b>6.6</b>
Bangalore	2.0	10.0
Bellary	1.5	6.0
Mandya	0.5	1.5
<b>Karnataka</b>	<b>1.2</b>	<b>5.0</b>
<b>Total</b>	<b>0.7</b>	<b>5.8</b>

The critical importance of trained teachers has been commented upon earlier. An assessment of the existence of trained teachers and their quality showed that a majority of school teachers surveyed in the two States were without any training on ICT tools. This figure was even greater in Karnataka (87%) than in Gujarat (81%). It was found that most of the teachers acquired training while in service & not in the pre-service period. This has an important implication for the curriculum of teachers training colleges throughout the country and also for the National Council for Teachers Education (NCTE). The largest number of trained teachers were in Ahmedabad while Surendranagar had the least.

**Table : H 15.1**  
**ICT Trained Teaching Staff**

District/State	Pre-Service		In-Service		Without Training	
	N	%	N	%	N	%
Ahmedabad	35	2.5	402	28.6	971	69.0
Patan	214	10.7	246	12.3	1548	77.1
Surendranagar	36	3.2	10	0.9	1090	96.0
<b>Gujarat</b>	213	4.7	653	14.3	3686	81.0
Bangalore	23	2.5	121	13.2	772	84.3
Bellary	53	3.8	145	10.3	1205	85.9
Mandya	13	1.2	90	8.2	989	90.6
<b>Karnataka</b>	89	2.6	356	10.4	2966	87.0

The number of non-teaching staff having training in ICT was low & ranged from 2% of the staff in Surendranagar to 10.5% in Bangalore with the exception of Patan. As noticed earlier more people received training while in service than before getting employed.

**Table : H 15.2**  
**Non-Teaching Staff with ICT Training**

District/State	Pre-Service		In-Service		Without Training	
	N	%	N	%	N	%
Ahmedabad	1	0.3	31	9.7	287	90.0
Patan	111	21.9	319	63.0	76	15.0
Surendranagar	3	2.0	0	0.0	149	98.0
<b>Gujarat</b>	115	11.8	350	35.8	512	52.4

**Table : H 15.2 (Continued)**  
**Non-Teaching Staff with ICT Training**

District/State	Pre-Service		In-Service		Without Training	
	N	%	N	%	N	%
Bangalore	3	1.8	15	8.8	153	89.5
Bellary	19	5.8	8	2.4	300	91.7
Mandya	4	2.6	9	5.8	143	91.7
<b>Karnataka</b>	26	4.0	32	4.9	596	91.1

A larger number of administrative staff were trained in ICT tools in Gujarat than in Karnataka. The largest deviation in these numbers from the average were noticed between Patan and Surendranagar within Gujarat.

**Table : H 15.3**  
**ICT Trained Administrative Staff**

District/State	Pre-Service		In-Service		Without Training	
	N	%	N	%	N	%
Ahmedabad	5	5.2	13	13.4	79	81.4
Patan	99	25.2	114	29.0	180	45.8
Surendranagar	3	1.1	4	1.4	271	97.5
<b>Gujarat</b>	107	13.9	131	17.1	530	69.0
Bangalore	2	2.2	19	20.4	72	77.4
Bellary	8	4.6	15	8.6	151	86.8
Mandya	1	0.7	9	6.1	138	93.2
<b>Karnataka</b>	11	2.7	43	10.4	361	87.0

The responding Heads of schools were queried about the competence of the teachers who had been trained at ICT. Many of the respondents reported that though the teaching staff had received training they still had no capability. While this figure was low in Gujarat it was quite significant in Karnataka at 20.2%. The quality and methodology of training was thus a serious issue. The largest number were rated as

having a fair amount of expertise in Gujarat by them while in Karnataka the maximum number were rated as good.

**Table : H 16.1**  
**ICT Trained Teachers with Level of Expertise**

	Excellent		Very Good		Good		Fair		No Capability	
	N	%	N	%	N	%	N	%	N	%
Ahmedabad	22	5.0	26	5.9	170	38.9	142	32.5	77	17.6
Patan	98	21.3	102	22.2	112	24.3	148	32.2	0	0.0
Surendranagar	5	10.9	3	6.5	14	30.4	24	52.2	0	0.0
<b>Gujarat</b>	125	14.4	131	15.1	296	34.2	314	36.3	0	0.0
Bangalore	21	14.6	12	8.3	65	45.1	39	27.1	7	4.9
Bellary	5	2.5	15	7.6	54	27.3	59	29.8	65	32.8
Mandya	2	1.9	8	7.8	41	39.8	34	33.0	18	17.5
<b>Karnataka</b>	28	6.3	35	7.9	160	36.0	132	29.7	90	20.2

66.7% of the trained non-teaching staff in Bellary was reported as having no capability! It seemed that the quality of training imparted in Bellary was of questionable character. In Gujarat 21.3% of the non-teaching staff which had received ICT training were rated as excellent at their level of expertise at these tools by the Heads while none were rated as such in Karnataka. The largest number of non-teaching staff was assessed to be good in the State while the maximum number of such staff in Gujarat was rated as fair.

**Table : H 16.2**  
**ICT Trained Non-Teaching Staff with Their Level of Expertise**

	Excellent		Very Good		Good		Fair		No Capability	
	N	%	N	%	N	%	N	%	N	%
Ahmedabad	5	15.6	7	21.9	11	34.4	7	21.9	2	6.3
Patan	94	21.9	97	22.6	102	23.7	137	31.9	0	0.0
Surendranaga	0	0.0	1	33.3	0	0.0	2	66.7	0	0.0
<b>Gujarat</b>	99	21.3	105	22.6	113	24.3	146	31.4	2	0.4
Bangalore	0	0.0	7	38.9	6	33.3	5	27.8	0	0.0
Bellary	0	0.0	4	14.8	5	18.5	0	0.0	18	66.7
Mandya	0	0.0	1	7.7	7	53.8	5	38.5	0	0.0
<b>Karnataka</b>	0	0.0	12	20.7	18	31.0	10	17.2	18	31.0

As far as the administrative staff is concerned it seemed that the quality of training imparted to them in Patan was good. The worst quality of training was perhaps in Ahmedabad where even after training 40.7% were reported as having no competence at ICT.

**Table : H 16.3**  
**ICT Trained Administrative Staff with Their Level of Expertise**

	<b>Excellent</b>		<b>Very Good</b>		<b>Good</b>		<b>Fair</b>		<b>No Capability</b>	
	N	%	N	%	N	%	N	%	N	%
Ahmedabad	3	11.1	7	25.9	8	29.6	9	33.3	11	40.7
Patan	57	26.8	43	20.2	47	22.1	65	30.5	0	0.0
Surendranaga	0	0.0	0	0.0	10	50.0	10	50.0	0	0.0
<b>Gujarat</b>	60	23.1	50	19.2	65	25.0	84	32.3	0	0.0
Bangalore	3	14.3	2	9.5	13	61.9	3	14.3	0	0.0
Bellary	0	0.0	5	21.7	6	26.1	12	52.2	0	0.0
Mandya	1	10.0	0	0.0	4	40.0	5	50.0	0	0.0
<b>Karnataka</b>	4	7.4	7	13.0	23	42.6	20	37.0	0	0.0

Both the availability and the number of ICT equipments like Projectors, Computers, Printers have an important bearing on the effectiveness of teaching and learning. The Heads of Schools enumerated the availability or otherwise of these tools. In Gujarat it was found that the maximum availability was of TVs, Radio/Cassette Players (RCPs) & Desktop Computers, in that order. In Karnataka it was Radio/Cassette Players, Desktops and Computer Speakers. The least available tool in both the States was the Bubble Jet Printer and then the Hand-held Computer. In Ahmedabad while the most accessible tool was the Desktop Computer, in the Districts of Patan and Surendranagar, it was the Television. However in all these three Districts it was the RCP which was the second most accessible piece of equipment. Easy availability of Computer Speakers in Ahmedabad – only a percentage less than Desktops – showed that the Computers were of recent vintage and equipped with multi-media. In Karnataka there was hardly any intra-State variation. All the three Districts ranked

RCPs as the most accessible tool and Desktop Computers as the next. Only the TV seemed more accessible in Bangalore!

**Table : H 17.1**  
**ICT Facilities Available in Schools**

ICT Facilities	Gujarat				Karnataka			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
OVERHEAD PROJECTOR	28.0	19.0	15.0	19.2	25.0	17.5	11.0	16.4
TV	39.0	63.0	50.5	53.2	32.0	13.5	7.0	14.6
VCD	16.0	8.5	4.5	8.4	10.0	5.0	2.0	4.8
VHS	6.0	1.0	0.0	1.6	4.0	0.0	0.5	1.0
DVD	8.0	1.0	2.0	2.8	3.0	0.5	1.0	1.2
VIDEO CAMERA	9.0	3.5	1.5	3.8	0.0	0.5	0.5	0.4
PHOTO CAMERA	21.0	16.0	6.5	13.2	19.0	7.0	4.0	8.2
RADIO/CASSETTE PLAYER	52.0	51.5	46.0	49.4	60.0	47.5	32.0	43.8
DIGITAL PHOTOCOPIER	3.0	2.0	0.0	1.4	0.0	1.0	1.5	1.0
MULTIMEDIA PROJECTOR	8.0	1.5	0.0	2.2	2.0	2.0	0.5	1.4
LCD PROJECTOR	9.0	0.5	9.5	5.8	1.0	0.5	0.5	0.6
DESKTOP	53.0	25.5	28.5	32.2	47.0	24.5	14.0	24.8
LAPTOP	10.0	4.0	3.5	5.0	6.0	1.0	1.0	2.0
HANDHELD/PDA	4.0	0.5	0.5	1.2	1.0	1.0	0.0	0.6
COLOUR PRINTER	29.0	8.5	3.0	10.4	11.0	4.5	3.0	5.2
BLACK AND WHITE PRINTER	26.0	12.0	9.0	13.6	29.0	14.0	9.0	15.0
DOT MATRIX	28.0	15.0	9.0	15.2	20.0	11.5	8.0	11.8
LASER PRINTER	9.0	5.0	1.5	4.4	4.0	0.0	0.0	0.8
INKJET PRINTER	24.0	3.0	5.0	8.0	8.0	3.5	1.5	3.6
BUBBLE JET	2.0	0.0	0.5	0.6	0.0	0.0	0.0	0.0
SCANNER	14.0	5.5	1.0	5.4	5.0	0.0	0.5	1.2
CD WRITER	20.0	6.0	2.0	7.2	6.0	1.5	1.0	2.2
COMPUTER SPEAKER	52.0	19.0	21.0	26.4	29.0	18.5	12.5	18.2

Assessing the information to discern rural/urban differentials in the two States it was found that the RCP, the Desktop Computer and the Computer Speaker occupied the first three ranks in urban areas of Gujarat. In rural schools it was the TV, the RCP and the Desktop. In urban Karnataka, the Desktop Computer, the RCPs and the Computer Speakers were most accessible while in rural areas it was the RCP, the Desktop Computer and the Overhead Projector, which occupied top slots in the

availability list. Thus there was no earth-shaking differences between urban and rural areas. However, newer technologies like CD Writers, Scanners and PDAs were available more easily in the urban areas.

**Table : H 17.2**  
**Availability of ICT Facilities as determined by Area**

ICT Facilities	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
OVERHEAD PROJECTOR	29.2	29.3	14.0	17.0	22.7	14.9
TV	40.0	51.2	58.7	19.7	13.6	11.2
VCD	15.4	22.0	4.0	8.0	6.8	2.2
VHS	5.4	2.4	0.0	1.6	0.0	0.7
DVD	5.4	9.8	0.9	1.6	4.5	0.4
VIDEO CAMERA	8.5	4.9	1.8	0.5	0.0	0.4
PHOTO CAMERA	23.1	14.6	9.1	11.2	15.9	4.9
RADIO/CASSETTE PLAYER	55.4	75.6	43.8	45.7	56.8	40.3
DIGITAL PHOTOCOPIER	3.8	0.0	0.6	0.5	0.0	1.5
MULTIMEDIA PROJECTOR	6.2	0.0	0.9	1.1	2.3	1.5
LCD PROJECTOR	6.2	9.8	5.2	1.1	0.0	0.4
DESKTOP	53.8	65.9	19.5	34.6	38.6	15.7
LAPTOP	10.0	9.8	2.4	2.7	2.3	1.5
HANDHELD/PDA	3.8	0.0	0.3	1.1	0.0	0.4
COLOUR PRINTER	23.1	12.2	5.2	9.6	11.4	1.1
BLACK AND WHITE PRINTER	27.7	19.5	7.3	22.9	15.9	9.3
DOT MATRIX	30.0	31.7	7.3	14.4	13.6	9.7
LASER PRINTER	10.8	9.8	1.2	2.1	0.0	0.0
INKJET PRINTER	18.5	14.6	3.0	5.3	9.1	1.5
BUBBLE JET	1.5	2.4	0.0	0.0	0.0	0.0
SCANNER	12.3	7.3	2.4	2.1	4.5	0.0
CD WRITER	17.7	17.1	1.8	3.7	2.3	1.1
COMPUTER SPEAKER	50.0	51.2	14.0	26.1	18.2	12.7

The availability of ICT facilities in the Government Schools in Gujarat was distinctly less than the private ones except perhaps the availability of television. While only 10.3% of Government Schools reported the availability of Desktop Computers 58.1% Private Schools had them. In Karnataka, both Government and Private Schools stated that RCPs and Desktop Computers were the two most available ICT equipment. However, while in Government Schools the next most important tool was the Overhead

Projector, it was the Computer Speaker in Private Schools. The number of Government Schools reporting availability of these tools were substantially less than the private ones. For example, 18.4% of Heads Government Schools in Karnataka stated that Desktops were available in school while 37.3% of Private Schools reported their availability. Interestingly, Overhead Projectors and Digital Photocopiers were more abundant in Government Schools. On the other hand there was no Scanner in any Government School! On the whole newer technologies were more accessible to Private School students. For example, while no Government School in Gujarat had a hand-held 2.6% Private Schools reported its availability.

**Table : H 17.3**  
**Availability of ICT Facilities as determined by Management of Schools**

ICT Facilities	Gujarat		Karnataka	
	Government / Public	Private	Government / Public	Private
OVERHEAD PROJECTOR	5.9	34.9	16.9	15.4
TV	58.3	47.2	13.3	17.2
VCD	3.0	14.8	2.7	8.9
VHS	0.0	3.5	0.9	1.2
DVD	0.0	6.1	0.6	2.4
VIDEO CAMERA	0.7	7.4	0.3	0.6
PHOTO CAMERA	6.3	21.4	5.4	13.6
RADIO/CASSETTE PLAYER	37.3	63.8	40.5	50.3
DIGITAL PHOTOCOPIER	1.5	1.3	1.5	0.0
MULTIMEDIA PROJECTOR	0.7	3.9	0.9	2.4
LCD PROJECTOR	0.7	11.8	0.3	1.2
DESKTOP	10.3	58.1	18.4	37.3
LAPTOP	1.1	9.6	2.1	1.8
HANDHELD/PDA	0.0	2.6	0.3	1.2
COLOUR PRINTER	5.2	16.6	2.1	11.2
BLACK AND WHITE PRINTER	4.1	24.9	12.4	20.1
DOT MATRIX	5.2	27.1	11.5	12.4
LASER PRINTER	1.5	7.9	0.0	2.4
INKJET PRINTER	1.1	16.2	1.8	7.1
BUBBLE JET	0.7	0.4	0.0	0.0
SCANNER	2.6	8.7	0.0	3.6
CD WRITER	2.6	12.7	1.2	4.1
COMPUTER SPEAKER	8.1	48.0	15.7	23.1

Secondary Schools in Gujarat were predictably more resource endowed than Primary Schools except in the availability of televisions. In Karnataka, Primary Schools had a larger number of RCPs than their Secondary School counter-parts.

**Table : H 17.4**  
**Availability of ICT Facilities according to Academic Level**

ICT Facilities	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
OVERHEAD PROJECTOR	1.6	37.4	2.9	29.2
TV	56.7	49.6	11.1	17.9
VCD	2.4	14.6	2.9	6.6
VHS	0.0	3.3	0.8	1.2
DVD	0.4	5.3	0.4	1.9
VIDEO CAMERA	1.6	6.1	0.0	0.8
PHOTO CAMERA	3.1	23.6	4.9	11.3
RADIO/CASSETTE PLAYER	32.7	66.7	47.3	40.5
DIGITAL PHOTOCOPIER	0.8	2.0	0.4	1.6
MULTIMEDIA PROJECTOR	0.8	3.7	0.4	2.3
LCD PROJECTOR	0.4	11.4	0.4	0.8
DESKTOP	8.3	56.9	10.7	38.1
LAPTOP	0.8	9.3	1.6	2.3
HANDHELD/PDA	0.8	1.6	0.8	0.4
COLOUR PRINTER	3.5	17.5	2.9	7.4
BLACK AND WHITE PRINTER	2.4	25.2	4.5	24.9
DOT MATRIX	2.0	28.9	4.1	19.1
LASER PRINTER	1.6	7.3	0.4	1.2
INKJET PRINTER	0.8	15.4	2.1	5.1
BUBBLE JET	0.0	1.2	0.0	0.0
SCANNER	1.6	9.3	0.8	1.6
CD WRITER	2.0	12.6	1.6	2.7
COMPUTER SPEAKER	5.5	48.0	7.4	28.4

The number of available units is an important indicator as it more accurately determines the accessibility to each student. Obviously, 10 Overhead Projectors are more effective than a single one in a large school. One found that the abundance of different technologies was directly related to their vintage. Older equipment like TVs, RCPs and Desktop Computers were more abundant than Multi-media Projectors and

Hand-held Computers. This was true for both the States. Differences between the capital cities and the distant Districts were also stark. In the 200 schools surveyed in Surendranagar there were only 2 Multi-media Projectors, 3 PDAs and 4 Scanners. Even in Ahmedabad there were only 589 Desktop Computers reported in 100 schools. This means less than 6 computers per school and 1 computer for 72 students on an average. While Gujarat had a total of 1,004 Desktops in 500 schools Karnataka had an even lesser number of 810 in 500 schools. No school in Karnataka reported the availability of a Video Camera. In Mandya there were no Scanners, LCD Projectors or PDAs.

**Table : H 17.5**  
**Number of Various ICT Facilities Available in Schools**

ICT Facilities	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
OVERHEAD PROJECTOR	37	51	34	122	23	41	27	91
TV	36	150	109	295	29	21	10	60
VCD	16	39	11	66	23	9	2	34
VHS	19	25	2	46	4	0	0	4
DVD	21	24	6	51	3	1	10	14
VIDEO CAMERA	43	34	10	87	0	0	0	0
PHOTO CAMERA	26	61	12	99	18	7	4	29
RADIO/CASSETTE PLAYER	68	123	81	272	59	88	54	201
DIGITAL PHOTOCOPIER	2	28	2	32	0	21	2	23
MULTIMEDIA PROJECTOR	8	28	2	38	2	15	0	17
LCD PROJECTOR	9	24	16	49	1	0	0	1
DESKTOP	589	242	173	1004	336	288	186	810
LAPTOP	60	31	32	123	12	0	25	37
HANDHELD/PDA	26	22	3	51	1	1	0	2
COLOUR PRINTER	22	40	8	70	17	5	5	27
BLACK AND WHITE PRINTER	22	51	18	91	25	19	10	54
DOT MATRIX	28	52	15	95	12	15	11	38
LASER PRINTER	7	32	5	44	4	0	0	4
INKJET PRINTER	21	34	9	64	8	3	2	13
BUBBLE JET	5	26	3	34	0	0	0	0
SCANNER	12	34	4	50	5	0	0	5
CD WRITER	22	31	9	62	9	0	2	11
COMPUTER SPEAKER	192	77	68	337	193	243	250	686

Schools in rural Gujarat had more TVs and RCPs and surprisingly even LCD Projectors, probably in the Private Schools. In rural Karnataka, schools had more Radio/Cassette Players and Multi-media Projectors than the urban schools. As the next Table would show the Multi-media Projectors are most probably in the Government Schools.

**Table : H 17.6**  
**Number of Various ICT Facilities Available according to Area**

ICT Facilities	GUJARAT			KARNATAKA		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
OVERHEAD PROJECTOR	52	12	58	41	17	33
TV	51	18	226	34	3	23
VCD	29	8	29	27	3	4
VHS	28	2	16	3	0	1
DVD	28	2	21	12	2	0
VIDEO CAMERA	54	4	29	0	0	0
PHOTO CAMERA	47	9	43	16	5	8
RADIO/CASSETTE PLAYER	86	23	163	85	20	96
DIGITAL PHOTOCOPIER	12	2	18	1	0	22
MULTIMEDIA PROJECTOR	17	2	19	2	0	15
LCD PROJECTOR	16	5	28	1	0	0
DESKTOP	691	154	159	396	95	319
LAPTOP	55	15	53	7	5	25
HANDHELD/PDA	32	2	17	1	0	1
COLOUR PRINTER	31	8	31	22	2	3
BLACK AND WHITE PRINTER	40	10	41	36	3	15
DOT MATRIX	44	14	37	18	2	18
LASER PRINTER	21	5	18	4	0	0
INKJET PRINTER	30	8	26	8	1	4
BUBBLE JET	13	5	16	0	0	0
SCANNER	22	6	22	3	2	0
CD WRITER	29	10	23	10	0	1
COMPUTER SPEAKER	210	43	84	275	71	340

Not surprisingly, Private Schools in Gujarat are better endowed as far as availability of ICT facilities are concerned. While Private Schools reported a total of 917 Desktops the relevant figure for Government Schools were only 87. This was true of most equipments except perhaps the television. In Karnataka, however it were the

Government Schools which were generally better endowed. Taking the figures of Desktop Computers again, Government Schools in Karnataka had 509 Desktops while Private Schools had only 301. However it needs to be remembered that out of 500 schools surveyed in Karnataka, 66.2% were Government Schools and 33.8% were Private Schools. Even accounting for this differential the Government Schools were in a better position.

**Table : H 17.7**  
**Number of Various ICT Facilities Available as determined by Management of Schools**

ICT Facilities	GUJARAT		KARNATAKA	
	Government / Public	Private	Government / Public	Private
OVERHEAD PROJECTOR	17	105	57	34
TV	184	111	33	27
VCD	15	51	7	27
VHS	6	40	2	2
DVD	8	43	10	4
VIDEO CAMERA	8	79	0	0
PHOTO CAMERA	26	73	11	18
RADIO/CASSETTE PLAYER	117	155	118	83
DIGITAL PHOTOCOPIER	7	25	23	0
MULTIMEDIA PROJECTOR	8	30	11	6
LCD PROJECTOR	7	42	0	1
DESKTOP	87	917	509	301
LAPTOP	16	107	31	6
HANDHELD/PDA	2	49	1	1
COLOUR PRINTER	14	56	8	19
BLACK AND WHITE PRINTER	10	81	30	24
DOT MATRIX	20	75	28	10
LASER PRINTER	9	35	0	4
INKJET PRINTER	9	55	6	7
BUBBLE JET	7	27	0	0
SCANNER	12	38	0	5
CD WRITER	11	51	2	9
COMPUTER SPEAKER	68	269	556	130

The Secondary Schools in both the States had a larger number of various ICT facilities available. In Gujarat, however, Primary Schools had more TVs and those in Karnataka had more RCPs than the Secondary Schools.

**Table : H 17.8**  
**Number of Various ICT Facilities Available as determined by Academic Level**

ICT Facilities	GUJARAT		KARNATAKA	
	Primary	Secondary	Primary	Secondary
OVERHEAD PROJECTOR	4	118	4	87
TV	165	130	23	37
VCD	7	59	21	13
VHS	0	46	2	2
DVD	2	49	1	13
VIDEO CAMERA	19	68	0	0
PHOTO CAMERA	12	87	9	20
RADIO/CASSETTE PLAYER	88	184	107	94
DIGITAL PHOTOCOPIER	3	29	1	22
MULTIMEDIA PROJECTOR	2	36	1	16
LCD PROJECTOR	0	49	1	0
DESKTOP	131	873	132	678
LAPTOP	0	123	6	31
HANDHELD/PDA	1	50	1	1
COLOUR PRINTER	9	61	5	22
BLACK AND WHITE PRINTER	8	83	10	44
DOT MATRIX	7	88	7	31
LASER PRINTER	4	40	1	3
INKJET PRINTER	2	62	4	9
BUBBLE JET	0	34	0	0
SCANNER	3	47	1	4
CD WRITER	4	58	6	5
COMPUTER SPEAKER	47	290	82	604

The location of computers in a school is an important determinant of its effectiveness in the teaching-learning process, Quite obviously, television in the staff-room or a desktop in the office is not of much help to children in their education. An assessment was made as to where the available computers had been installed. It was found that a majority of them were in computer labs. An overwhelming majority in Gujarat (40.4%) were in computer labs. The next popular location was the

Administrator's Office. Comparing the two States it was found that there were more computers even in the classrooms in Gujarat than in Karnataka. The minimum number of computers were in the staff-rooms/teachers' lounge or in the library. This also brings into focus the needs for implementing ICT tools in libraries.

**Table : H 18.1  
Location of Computers in Schools**

Location	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Computer Laboratory	55.0	52.5	21.0	40.4	53.0	29.0	14.5	28.0
Classroom	3.0	20.0	2.0	9.4	7.0	4.0	1.5	3.6
Teacher's Lounge	0.0	0.0	0.5	0.2	1.0	0.0	0.5	0.4
Administrator's Office	17.0	10.0	8.5	10.8	7.0	2.5	0.5	2.6
Library	5.0	2.0	0.0	1.8	0.0	0.0	0.5	0.2
Others	8.0	0.0	2.5	2.6	0.0	1.5	0.5	0.8

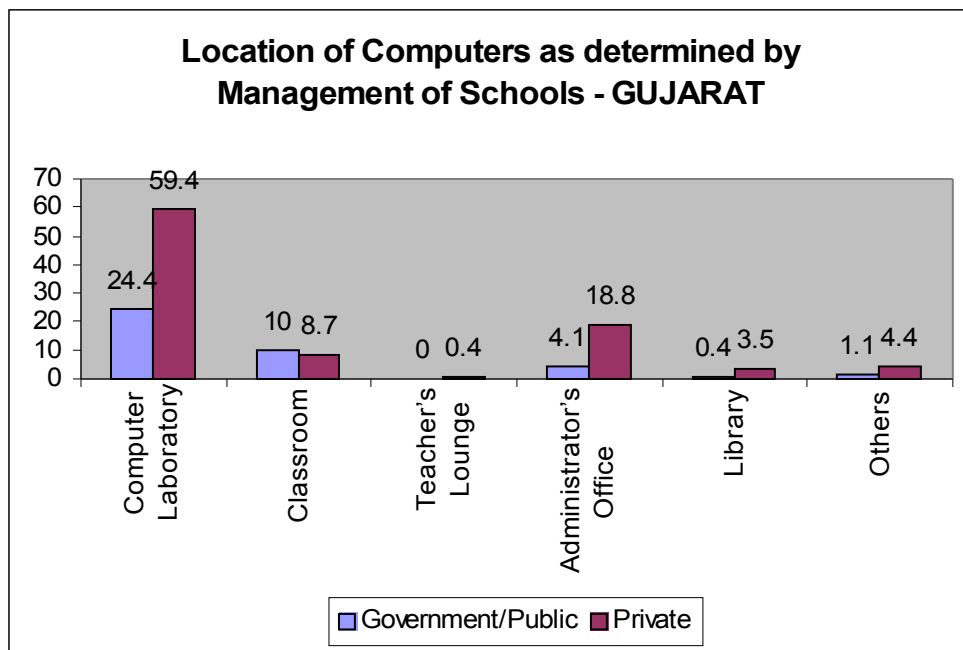
Classrooms seemed to be a more popular location for computers in rural Gujarat than in urban areas. More school offices in urban areas had computers possibly because the number of Private Schools in these areas was larger. Various activities like receipt of fee; pay roll, maintenance of leave account etc. have been computerized in Private Schools. In Karnataka, more classrooms in urban areas had computers while there were hardly any in the libraries.

**Table : H 18.2  
Location of Computers in Schools as determined by Area**

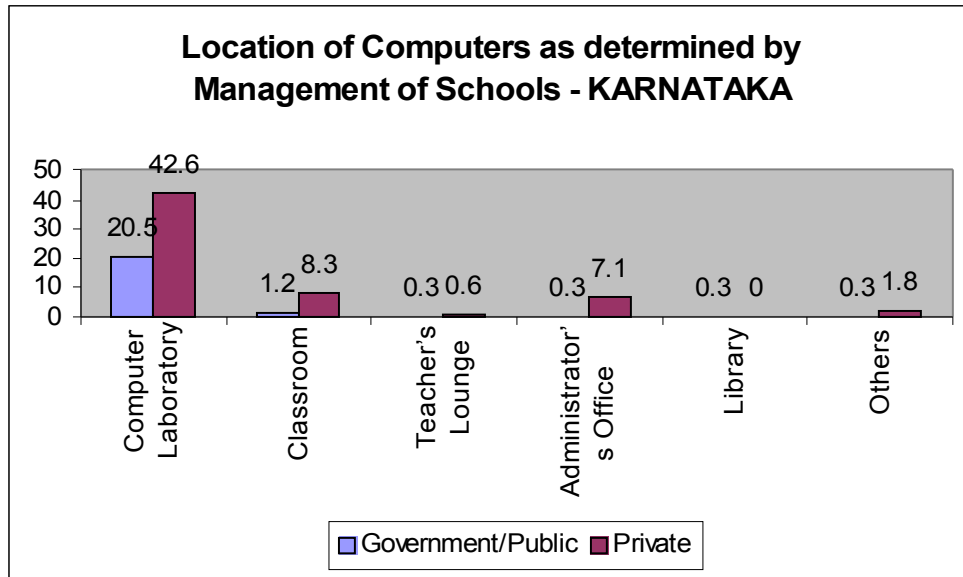
Location	GUJARAT			KARNATAKA		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Computer Laboratory	57.7	48.8	32.5	39.9	38.6	17.9
Classroom	5.4	4.9	11.6	6.9	4.5	1.1
Teacher's Lounge	0.0	0.0	0.3	0.5	0.0	0.4
Administrator's Office	17.7	14.6	7.6	5.3	2.3	0.7
Library	4.6	0.0	0.9	0.0	0.0	0.4
Others	6.2	0.0	1.5	1.1	2.3	0.4

In Gujarat, more Private Schools had computers located in a separate laboratory as compared to their Government counter-parts. Classrooms were more favoured by Government Schools to locate computers. As noticed earlier more Private School offices had been computerized. In Karnataka, similar to Gujarat more Private Schools have computers placed in a distinct computer laboratory. However, the classroom was also a favoured location in Private Schools in Karnataka, unlike Gujarat. As noticed earlier in the case of Private Schools in Gujarat, Karnataka Private Schools also had computerized their administrative processes much more than Government Schools. Interestingly, not a single computer has been installed in any of the libraries of Private Schools in Karnataka. Perhaps Private Schools Managements found more use for the computer in the office than in the library.

**Figure : H.18.3**



**Figure : H.18.3**



Comparing the location of computers in Primary Schools with Secondary Schools it was found that Secondary Schools had more computers in laboratories than in the classrooms. This was true for both the States. One could presume that size was a determinant in location as computers in a lab could be more intensively utilized than if they were placed in the classrooms. Many more computers were installed in the Administrator's Office of Secondary Schools than in Primary Schools. This was possibly because Primary Schools were smaller and administrative processes simpler.

**Table : H 18.4**  
**Location of Computers in Schools according to Academic Level**

Location	GUJARAT		KARNATAKA	
	Primary	Secondary	Primary	Secondary
Computer Laboratory	20.5	54.2	11.9	43.1
Classroom	10.2	9.5	2.1	5.1
Teacher's Lounge	0.0	0.6	0.0	0.8
Administrator's Office	2.0	18.5	1.6	3.5
Library	0.4	2.4	0.0	0.4
Others	0.8	3.6	0.4	1.2

An assessment of the length of time of possessing computers was made during the course of the survey. It was found that only a miniscule percentage of schools had computers 8 years back. These were also more noticeable in the urban areas which clearly points to the fact that computers first became accessible in towns. The maximum percentage of schools in Gujarat had acquired computers in the last 1-2 years while it was 2-4 years for Karnataka.

**Table : H 19.1**  
**Duration of Availability of Computers in Schools**

<b>District/State</b>	<b>Less than 1 Year</b>	<b>1 – 2 Years</b>	<b>2 - 4 Years</b>	<b>4 - 8 Years</b>	<b>More Than 8 Years</b>
Ahmedabad	2.0	9.0	17.0	21.0	9.0
Patan	12.0	28.5	10.0	4.5	2.5
Surendranagar	6.0	8.0	5.0	1.5	0.0
<b>Gujarat</b>	<b>7.6</b>	<b>16.4</b>	<b>9.4</b>	<b>6.6</b>	<b>2.8</b>
Bangalore	4.0	4.0	22.0	15.0	7.0
Bellary	5.5	4.5	16.5	3.0	0.0
Mandya	2.5	3.0	8.0	1.5	0.0
<b>Karnataka</b>	<b>4.0</b>	<b>3.8</b>	<b>14.2</b>	<b>4.8</b>	<b>1.4</b>

The Table below reinforces the finding reached earlier that it was the urban areas which saw the advent of computers in India. The case of rural Karnataka is instructive. While 8 years back there was no computer in any school, now several schools have computers and the maximum numbers of computers were acquired in the last 2-4 years.

**Table : H 19.2**  
**Duration of Availability of Computers as determined by Area**

<b>Area of School</b>	<b>Less than 1 Year</b>	<b>1 – 2 Years</b>	<b>2 - 4 Years</b>	<b>4 - 8 Years</b>	<b>More Than 8 Years</b>
Urban	3.8	15.4	16.9	16.9	8.5
Semi-urban	7.3	12.2	19.5	9.8	0.0
Rural	9.1	17.3	5.2	2.1	0.9
<b>Gujarat</b>	<b>7.6</b>	<b>16.4</b>	<b>9.4</b>	<b>6.6</b>	<b>2.8</b>
Urban	3.7	6.4	17.6	10.1	2.7
Semi-urban	2.3	4.5	20.5	6.8	4.5
Rural	4.5	1.9	10.8	0.7	0.0
<b>Karnataka</b>	<b>4.0</b>	<b>3.8</b>	<b>14.2</b>	<b>4.8</b>	<b>1.4</b>

It seems that it were the Private Schools which started investing in ICT earlier. While 3.6% of Private Schools had computers eight years back only 0.3% of the Government Schools at that time had computers. Compared to Gujarat the investment in hardware started earlier in Karnataka. However this also means that computers in the State are of older vintage.

**Table : H 19.3**  
**Duration of Availability of Computers as determined by Management of Schools**

<b>School Management</b>	<b>Less than 1 Year</b>	<b>1 – 2 Years</b>	<b>2 - 4 Years</b>	<b>4 - 8 Years</b>	<b>More Than 8 Years</b>
Government or Public	5.5	14.0	4.1	2.6	0.7
Private	10.0	19.2	15.7	11.4	5.2
<b>Gujarat</b>	<b>7.6</b>	<b>16.4</b>	<b>9.4</b>	<b>6.6</b>	<b>2.8</b>
Government or Public	3.6	2.1	13.6	0.9	0.3
Private	4.7	7.1	15.4	12.4	3.6
<b>Karnataka</b>	<b>4.0</b>	<b>3.8</b>	<b>14.2</b>	<b>4.8</b>	<b>1.4</b>

The Table given below shows that it were the Secondary Schools which acquired computers much earlier than Primary Schools in both the States.

**Table : H 19.4**  
**Duration of Availability of Computers according to Academic Level**

<b>Type of School</b>	<b>Less than 1 Year</b>	<b>1 – 2 Years</b>	<b>2 - 4 Years</b>	<b>4 - 8 Years</b>	<b>More Than 8 Years</b>
Primary	2.8	13.4	3.9	2.8	1.2
Secondary	12.6	19.5	15.0	10.6	4.5
<b>Gujarat</b>	<b>7.6</b>	<b>16.4</b>	<b>9.4</b>	<b>6.6</b>	<b>2.8</b>
Primary	1.6	2.1	4.5	3.3	0.8
Secondary	6.2	5.4	23.3	6.2	1.9
<b>Karnataka</b>	<b>4.0</b>	<b>3.8</b>	<b>14.2</b>	<b>4.8</b>	<b>1.4</b>

An assessment of the operating systems being used in the computers showed that unsurprisingly Windows was the dominant OS. What was more interesting was that Linux was the second most popular OS. This could perhaps be because of the

efforts of the Governments at various levels to encourage open source software. The maximum usage of Linux was in Bangalore. Karnataka as a State was more open to Linux than Gujarat. The usage of other operating systems in the schools was only marginal.

**Table : H 20.1  
Operating Systems Used in Schools**

<b>District/State</b>	<b>WINDOWS</b>	<b>LINUX</b>	<b>APPLE MACINTOSH</b>	<b>UNIX</b>	<b>DOS</b>	<b>OTHERS</b>
Ahmedabad	55.0	0.0	1.0	2.0	27.0	10.0
Patan	50.5	18.5	0.0	0.0	0.0	0.0
Surendranagar	20.5	1.0	0.5	0.5	0.5	0.5
<b>Gujarat</b>	<b>39.4</b>	<b>7.8</b>	<b>0.4</b>	<b>0.6</b>	<b>5.6</b>	<b>2.2</b>
Bangalore	51.0	24.0	6.0	1.0	25.0	5.0
Bellary	28.5	15.5	4.0	0.5	15.0	6.0
Mandya	15.0	9.5	0.5	0.5	9.0	0.0
<b>Karnataka</b>	<b>27.6</b>	<b>14.8</b>	<b>3.0</b>	<b>0.6</b>	<b>14.6</b>	<b>3.4</b>

In Gujarat, there was a dominance of Windows both in the urban, semi-urban and rural areas. In Karnataka, however, the urban areas showed a substantial presence of Linux. What was surprising was that older operating systems like DOS were still being used in 5.6% of the computers in Gujarat and even higher at 14.6% in Karnataka. Even in the urban areas of Ahmedabad and Bangalore about a quarter 20% of the computers were functioning on DOS.

**Table : H 20.2  
Operating Systems Used in Schools as determined by Area**

<b>Area</b>	<b>WINDOWS</b>	<b>LINUX</b>	<b>APPLE MACINTOSH</b>	<b>UNIX</b>	<b>DOS</b>	<b>OTHERS</b>
Urban	57.7	3.1	0.8	0.8	19.2	6.9
Semi-urban	48.8	4.9	2.4	2.4	2.4	0.0
Rural	31.0	10.0	0.0	0.3	0.6	0.6
<b>Gujarat</b>	<b>39.4</b>	<b>7.8</b>	<b>0.4</b>	<b>0.6</b>	<b>5.6</b>	<b>2.2</b>
Urban	40.4	22.9	4.8	1.1	23.9	4.3
Semi-urban	34.1	11.4	2.3	0.0	9.1	2.3
Rural	17.5	9.7	1.9	0.4	9.0	3.0
<b>Karnataka</b>	<b>27.6</b>	<b>14.8</b>	<b>3.0</b>	<b>0.6</b>	<b>14.6</b>	<b>3.4</b>

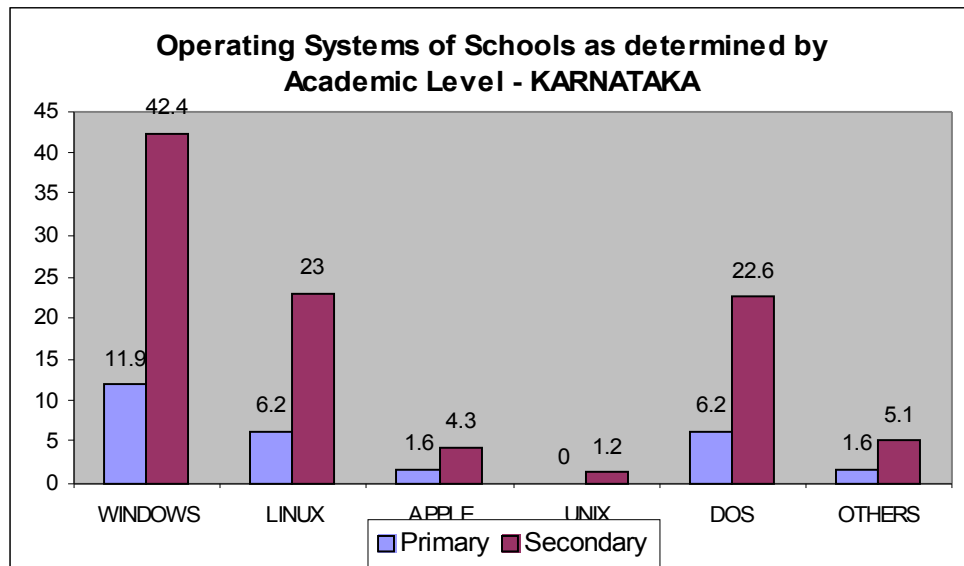
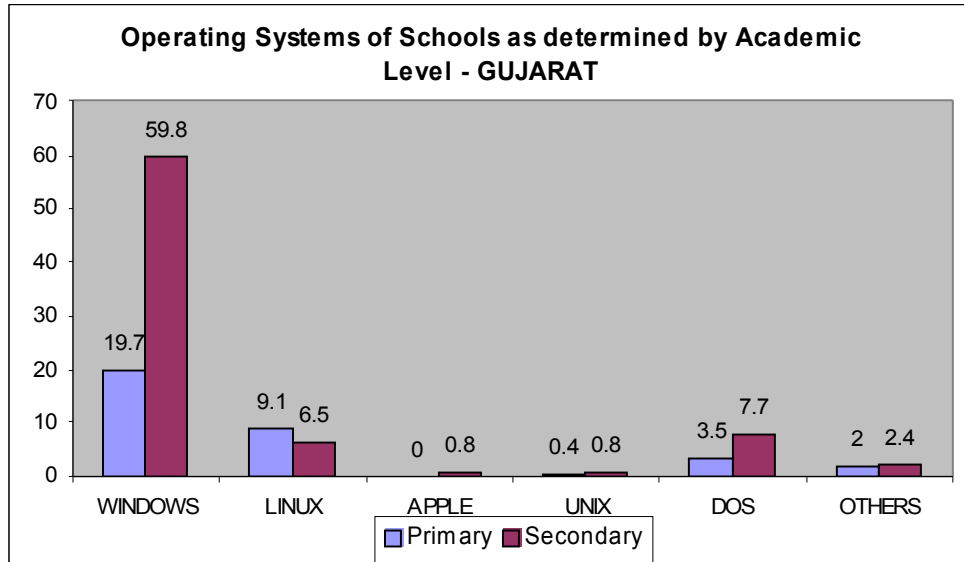
The fact that half of both Government and Private Schools in Karnataka had computers operating on Linux was remarkable. Older operating system, DOS had a significant presence in Private Schools. This could perhaps be because computers were introduced in Private Schools earlier and could also mean conversely that computers in Government Schools were of more recent vintage.

**Table : H 20.3**  
**Operating Systems as determined by Management of Schools**

<b>Management</b>	<b>WINDOWS</b>	<b>LINUX</b>	<b>APPLE MACINTOSH</b>	<b>UNIX</b>	<b>DOS</b>	<b>OTHERS</b>
Government or Public	23.2	8.5	0.0	0.4	1.8	1.5
Private	58.5	7.0	0.9	0.9	10.0	3.1
<b>Gujarat</b>	39.4	7.8	0.4	0.6	5.6	2.2
Government or Public	20.2	11.2	2.1	0.3	10.9	2.4
Private	42.0	21.9	4.7	1.2	21.9	5.3
<b>Karnataka</b>	27.6	14.8	3.0	0.6	14.6	3.4

An assessment of the usage of different operating systems in Primary & Secondary Schools of the two States again confirmed the pre-dominance of Microsoft Windows. The maximum popularity of Linux was in Karnataka Secondary Schools. However, the maximum number of computers having DOS was also in Secondary Schools in Karnataka. The reason could perhaps be that ICT was introduced in the Secondary Schools earlier and the emphasis on acquiring hardware for Secondary Schools continues but with open source software now.

**Figure : H 20.4**



The importance of networked computers cannot be over-emphasised. They facilitate easier access to information, encourage team-building and project work apart from faster communication. Karnataka schools were better placed in this respect than schools in Gujarat. More than double the number were networked in Karnataka than in Gujarat. Even in the category of all computers being networked Karnataka was way ahead of Gujarat. As noticed earlier there was more variation intra-State on this factor in Gujarat than in Karnataka. While in Gujarat the number of computers networked ranged from 3% in Surendranagar to 11% in Ahmedabad, for Karnataka the range was from 10.5% in Mandya to 15% in Bangalore and Bellary. Again, the maximum number of computers networked were in Bangalore and Bellary. The maximum number of 'no computers networked' was in the Districts of Patan not only in Gujarat but among all the 6 Districts. Surprisingly, the maximum number of 'no computers networked' in Karnataka were in Bangalore!

**Table : H 21.1**  
**Number of Networked Computers in Schools**

<b>District/State</b>	<b>All the Computers</b>	<b>Some of the Computers</b>	<b>None</b>
Ahmedabad	11.0	15.0	29.0
Patan	4.0	19.0	40.5
Surendranagar	3.0	2.5	15.0
<b>Gujarat</b>	5.0	11.6	28.0
Bangalore	15.0	7.0	31.0
Bellary	15.0	1.5	10.5
Mandya	10.5	1.0	3.0
<b>Karnataka</b>	13.2	2.4	11.6

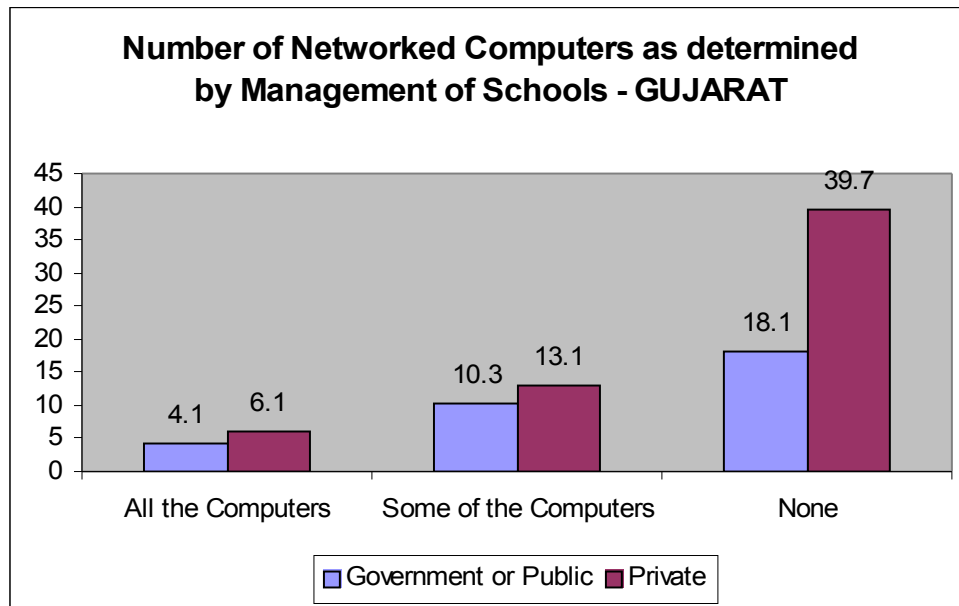
Not surprisingly, more urban schools have interconnected computers than rural areas in both the States. This is obviously directly related to the access to telecommunication facilities.

**Table : H 21.2**  
**Number of Networked Computers in Schools according to Area**

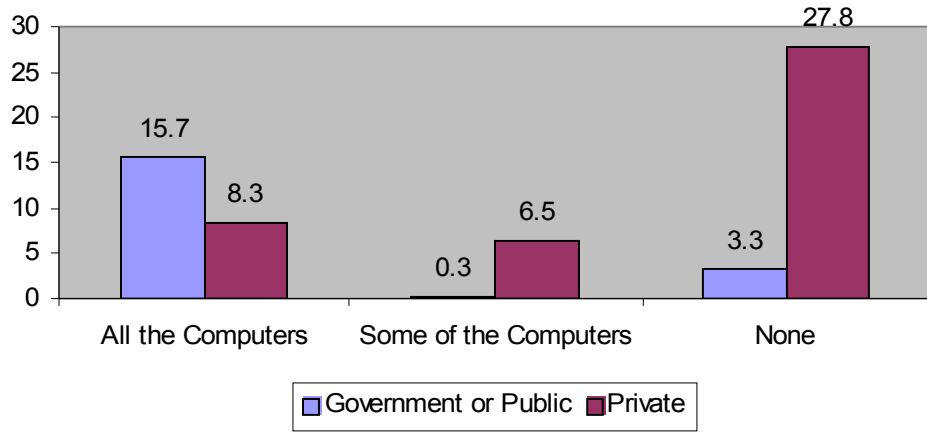
Area of School	All the Computers	Some of the Computers	None
Urban	8.5	15.4	36.2
Semi-urban	9.8	9.8	29.3
Rural	3.0	10.3	24.6
<b>Gujarat</b>	5.0	11.6	28.0
Urban	14.9	5.3	19.1
Semi-urban	13.6	0.0	22.7
Rural	11.9	0.7	4.5
<b>Karnataka</b>	13.2	2.4	11.6

Comparing the percentage of 'all computers networked' between Government and Private Schools it was found that more Private Schools had all computers networked in Gujarat but the position was reverse in Karnataka. However, more computers in Private Schools in both the States were not networked at all. Perhaps the costs associated with networking were sought to be avoided by Private Schools.

**Figure : H 21.3**



**Number of Networked Computers as determined  
by Management of Schools - KARNATAKA**



As would be expected Secondary Schools have more networked computers in the category of all computers networked. Practically the same number of Primary Schools are networked in both the States. However, many more Karnataka Secondary Schools are networked than in Gujarat. The focus in Karnataka is quite clear – Secondary Education.

**Table : H 21.4**  
**Number of Networked Computers according to Academic Level**

<b>School Type</b>	<b>All the Computers</b>	<b>Some of the Computers</b>	<b>None</b>
Primary	3.5	11.4	13.4
Secondary	6.5	11.8	43.1
<b>Gujarat</b>	<b>5.0</b>	<b>11.6</b>	<b>28.0</b>
Primary	3.3	1.2	8.2
Secondary	22.6	3.5	14.8
<b>Karnataka</b>	<b>13.2</b>	<b>2.4</b>	<b>11.6</b>

An assessment of the distribution of access to electricity and communication facilities brought to the fore the digital divide between the capital cities and the Districts. A comparison of the two States showed that Gujarat had better access to devices like the Mobile Phone, Cable TV and reliable electricity supply. The only exception was access to the Internet which was better in Karnataka.

**Table : H 22.1  
Access of Schools to Various Facilities**

	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Connection to electrical grid	51.0	50.0	14.0	35.8	33.0	25.5	20.0	24.8
Electricity from ups	19.0	7.0	4.5	8.4	22.0	16.5	9.0	14.6
Solar electricity	16.0	2.0	1.0	4.4	1.0	1.0	0.0	0.6
Wind electricity	16.0	1.5	1.0	4.2	0.0	0.0	0.0	0.0
Landline telephone	47.0	40.0	10.5	29.6	51.0	26.0	14.0	26.2
Mobile phone	15.0	5.0	1.0	5.4	7.0	4.0	1.0	3.4
Fax machine	2.0	0.5	1.0	1.0	3.0	0.5	0.0	0.8
Internet	25.0	2.0	2.0	6.6	19.0	5.5	9.0	9.6
Satellite connections	1.0	1.0	0.0	0.6	0.0	1.0	0.0	0.4
Cable TV	19.0	4.0	2.0	6.2	9.0	6.5	1.5	5.0

Assessing the information available according to region it was found that the accessibility of schools to such equipment and devices was directly related to the level of urbanization in both the States. While 50.8% urban Gujarat Schools were connected to the electricity grid only 30.7% of such schools in rural areas were thus connected. The respective figures in Karnataka were 29.8% and 19.4%. 19.2% urban schools in Gujarat were connected to the Internet but only 1.5% rural schools had this facility. The relevant figures for Karnataka were 12.2% and 17.1%.

**Table : H 22.2**  
**Access to Various Facilities according to Area**

	GUJARAT			KARNATAKA		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Connection to electrical grid	50.8	29.3	30.7	29.8	36.4	19.4
Electricity from ups	17.7	9.8	4.6	19.1	9.1	12.3
Solar electricity	12.3	4.9	1.2	0.5	0.0	0.7
Wind electricity	12.3	4.9	0.9	0.0	0.0	0.0
Landline telephone	50.0	34.1	21.0	39.9	31.8	15.7
Mobile phone	13.8	4.9	2.1	6.9	4.5	0.7
Fax machine	2.3	4.9	0.0	0.5	4.5	0.4
Internet	19.2	7.3	1.5	12.2	13.6	7.1
Satellite connections	1.5	0.0	0.3	0.5	0.0	0.4
Cable TV	15.4	7.3	2.4	5.9	9.1	3.7

Private Schools in Gujarat were decidedly much better placed. 5 times more Private Schools had access to a landline Television and more than 10 times Private Schools had access to the Internet. The same was true for Private Schools in Karnataka also, though the variations were not so sharp. The Government Schools in Karnataka had better access to the Internet.

**Table : H 22.3**  
**Access to Various Facilities as determined by Management of Schools**

	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
Connection to electrical grid	26.2	47.2	21.1	32.0
Electricity from ups	7.0	10.0	14.2	15.4
Solar electricity	3.7	5.2	0.9	0.0
Wind electricity	3.3	5.2	0.0	0.0
Landline telephone	10.0	52.8	19.6	39.1
Mobile phone	2.2	9.2	0.9	8.3
Fax machine	0.0	2.2	0.0	2.4
Internet	1.1	13.1	11.5	5.9
Satellite connections	0.4	0.9	0.3	0.6
Cable TV	2.6	10.5	4.8	5.3

Secondary Schools in both the States were better endowed with electrical and communication facilities. This difference was most discernable in the availability of landline Telephone. 10 times more Secondary Schools in Gujarat had access to a Telephone than Primary Schools. The biggest differential in Karnataka was in the availability of the Internet.

**Table : H 22.4**  
**Access to Various Facilities according to Academic Level**

	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Connection to electrical grid	24.4	47.6	12.3	36.6
Electricity from ups	6.7	10.2	4.1	24.5
Solar electricity	4.7	4.1	0.0	1.2
Wind electricity	4.7	3.7	0.0	0.0
Landline telephone	4.7	55.3	10.7	40.9
Mobile phone	3.1	7.7	2.9	3.9
Fax machine	0.4	1.6	0.0	1.6
Internet	2.4	11.0	0.8	17.9
Satellite connections	0.4	0.8	0.0	0.8
Cable TV	3.1	9.3	3.7	6.2

As mentioned earlier, the availability of Computers per student has been found to be quite low. It could, therefore, be presumed that all students did not have access to the Schools' Computers. It was however important to ascertain what proportion of students had such an access. Percentage of respondents which reported that none of the students had access to computers and the ones which had not responded were added on the assumption that they would have responded in case access was available. It was found that more Gujarat School students had access to computers than their Karnataka counter-parts. Heads of Schools which reported that all students had access to computers were only 6% in Gujarat but were 19.8% in Karnataka. Again, the maximum number of Heads of Schools which reported that all students had access was the maximum in Bangalore and then in Ahmedabad. No school in Surendranagar reported under this head. The least access to computers was also in Surendranagar.

**Table : H 23.1**  
**Students' Access to School Computers**

Extent of Access	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
None	14.0	32.5	29.0	27.4	20.0	15.0	2.0	10.8
About 10%	3.0	25.5	3.0	12.0	0.0	2.5	0.0	1.0
About 25%	3.0	5.0	2.0	3.4	3.0	1.0	0.0	1.0
About 50%	7.0	3.5	1.5	3.4	3.0	3.0	0.5	2.0
About 75%	15.0	4.5	2.0	5.6	7.0	3.5	3.0	4.0
All Students	26.0	2.0	0.0	6.0	39.0	17.5	12.5	19.8
Not Responded	32.0	27.0	62.5	42.2	28.0	57.5	82.0	61.4

The urban-rural differentials were apparent when data was tabulated according to region. Students in rural schools in both Gujarat and Karnataka were more deprived than their urban counter-parts. The situation in rural Gujarat was worse than in rural Karnataka.

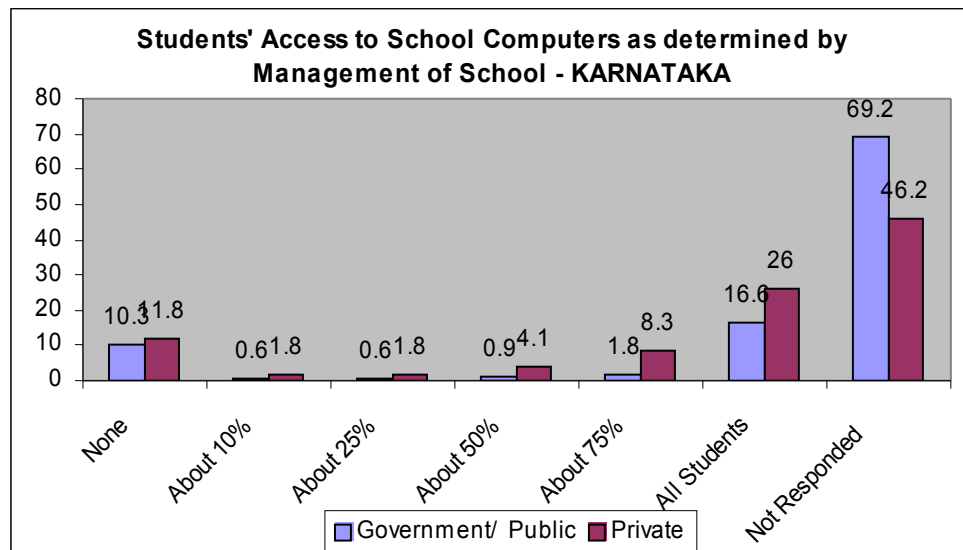
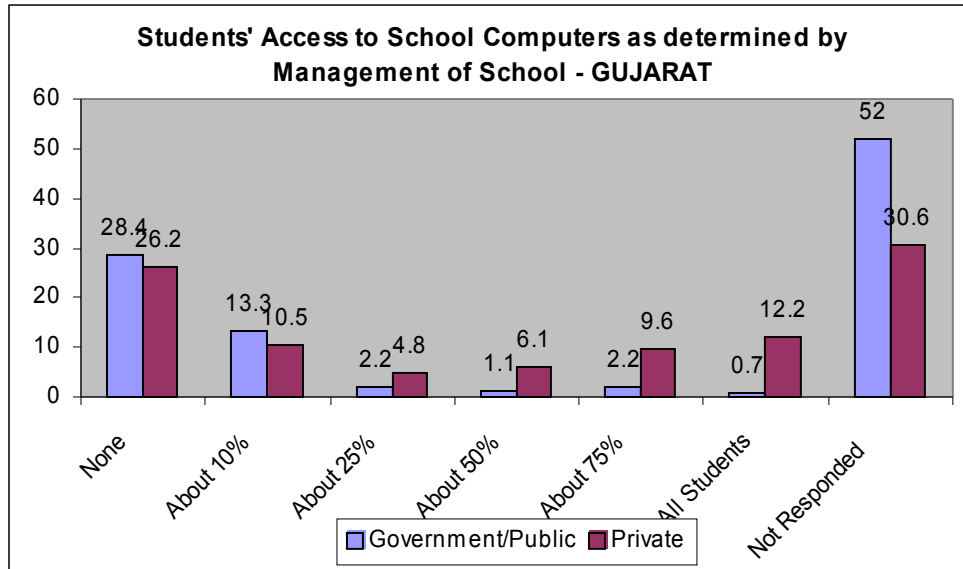
**Table : H 23.2**  
**Students' Access to School Computers as determined by Area**

Extent of Access	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
None	19.2	14.6	32.2	12.8	4.5	10.4
About 10%	7.7	9.8	14.0	1.1	0.0	1.1
About 25%	2.3	7.3	3.3	2.1	0.0	0.4
About 50%	7.7	9.8	0.9	3.2	2.3	1.1
About 75%	12.3	7.3	2.7	5.9	6.8	2.2
All Students	20.8	2.4	0.6	28.2	29.5	12.3
Not Responded	30.0	48.8	46.2	46.8	56.8	72.4

In Government Schools in Gujarat 80.4% had no access to computers. The situation in Private Schools were better as only 56.8% of the Heads reported that their students had no access to computers. Heads reporting that all their students had access to computers was only 0.7% for Government Schools while it was 12.2% for Private Schools. In Karnataka too the situation was similar. 79.5% of the Government

Schools – a number comparable to Gujarat – did not have access while for Private Schools the figure was 58%, again similar to Gujarat. However, 16.6% of the Heads of Schools of Government Schools in Karnataka reported that all their students had access. Private Schools students were however even better placed. 26% said that all students had access to PCs.

**Figure : H 23.3**



Secondary School students in both the States had better access to computers.

**Table : H 23.4**  
**Students' Access to School Computers according to Academic Level**

Extent of Access	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
None	24.4	30.5	11.5	10.1
About 10%	14.2	9.8	0.4	1.6
About 25%	0.8	6.1	0.4	1.6
About 50%	1.2	5.7	1.6	2.3
About 75%	1.2	10.2	2.9	5.1
All Students	3.5	8.5	7.4	31.5
Not Responded	54.7	29.3	75.7	47.9

Adding the number of Heads which had not responded and the ones which had responded that no teacher had access to computers in their school it was found that marginally more number of Karnataka teachers (75.2%) do not have access when compared to the ones in Gujarat (71.4%). However, the number of teachers, all of whom were reported to have access, was higher in Karnataka at 6% than in Gujarat which was only 2.8%. The District of Surendranagar remained the worst.

**Table : H 24.1**  
**Teachers' Access to School Computers**

Extent of Access	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
None	20.0	35.5	26.5	28.8	22.0	16.5	5.0	13.0
About 10%	22.0	28.0	8.0	18.8	24.0	8.0	2.5	9.0
About 25%	8.0	2.5	0.5	2.8	3.0	3.0	1.0	2.2
About 50%	5.0	4.5	0.5	3.0	7.0	2.5	3.5	3.8
About 75%	2.0	1.0	1.0	1.2	4.0	4.0	3.5	3.8
All Teachers	12.0	0.0	1.0	2.8	11.0	6.5	3.0	6.0
Not Responded	31.0	28.5	62.5	42.6	29.0	59.5	81.5	62.2

As would be expected teachers in rural areas of both the States were more deprived as far as their access to computers were concerned.

**Table : H 24.2**  
**Teachers' Access to School Computers as determined by Area**

Extent of Access	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
None	25.4	22.0	31.0	19.1	2.3	10.4
About 10%	21.5	14.6	18.2	13.3	15.9	4.9
About 25%	8.5	2.4	0.6	3.7	4.5	0.7
About 50%	4.6	0.0	2.7	6.4	6.8	1.5
About 75%	1.5	4.9	0.6	2.1	9.1	4.1
All Teachers	9.2	4.9	0.0	7.4	4.5	5.2
Not Responded	29.2	51.2	46.8	47.9	56.8	73.1

Lack of access affected teachers in Government Schools more than those in Private Schools. The only exception was those Heads in Karnataka which reported that all the teacher had access. Here more Government School Teachers (6.6%) had access than those in Private Schools (4.7%).

**Table : H 24.3**  
**Teachers' Access to School Computers according to Management**

Extent of Access	Gujarat		Karnataka	
	Government /Public	Private	Governme nt/Public	Private
None	29.2	28.4	11.2	16.6
About 10%	13.3	25.3	3.3	20.1
About 25%	1.1	4.8	1.2	4.1
About 50%	2.2	3.9	3.6	4.1
About 75%	0.7	1.7	4.5	2.4
All Teachers	0.7	5.2	6.6	4.7
Not Responded	52.8	30.6	69.5	47.9

Access to computers was better for Secondary School Teachers in both the States.

**Table : H 24.4**  
**Teachers' Access to School Computers according to Academic Level**

Extent of Access	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
None	24.4	33.3	12.8	13.2
About 10%	15.7	22.0	5.3	12.5
About 25%	0.8	4.9	1.6	2.7
About 50%	0.4	5.7	1.6	5.8
About 75%	0.8	1.6	1.2	6.2
All Teachers	2.4	3.3	0.8	10.9
Not Responded	55.5	29.3	76.5	48.6

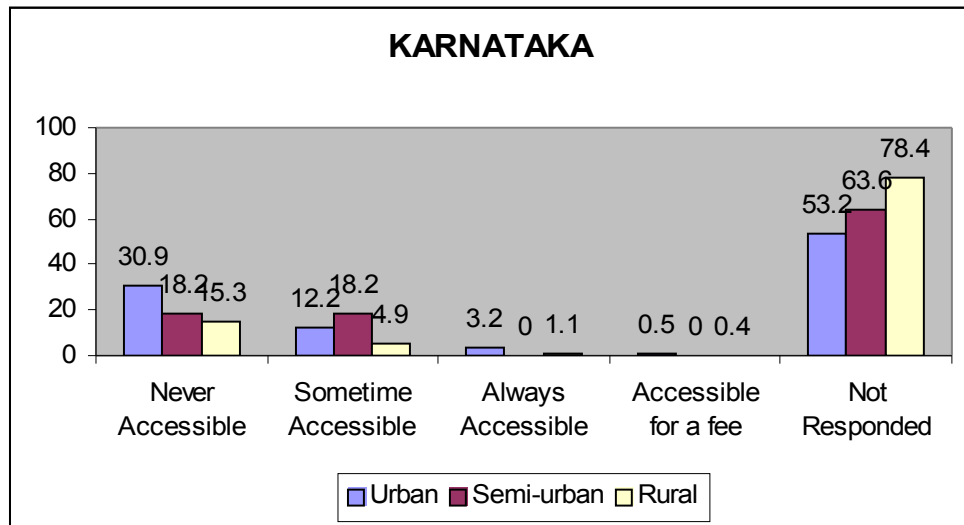
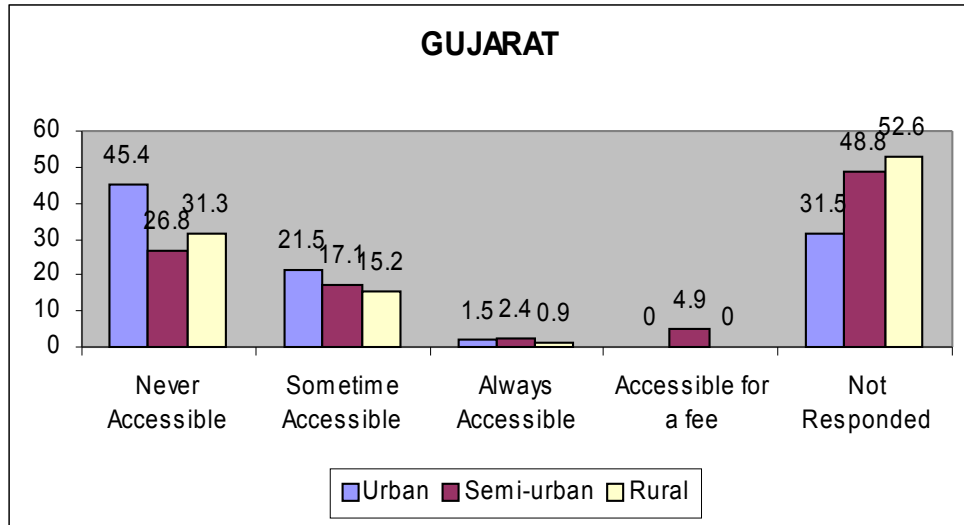
Curriculum concerns pre-dominate school hours and, therefore, to fully utilize the benefits of ICT, it is important that access be available after school hours also. The Heads of Schools were, therefore, asked about the accessibility of such devices to both teachers and students after school hour. The Table depicted below would show that they were mostly never accessible. The lack of such access was most discernible in Surendranagar. There was no provision for access to these devices after school hours even on payment of a fee. This was true for urban schools also. An important source of revenue for schools was therefore left unexploited.

**Table : H 25.1**  
**Access of Teachers & Students to Computers After School Hours**

Extent of Access	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Never Accessible	42.0	46.0	19.5	34.6	40.0	24.5	9.0	21.4
Sometime Accessible	22.0	23.5	8.0	17.0	17.0	6.5	7.0	8.8
Always Accessible	2.0	1.5	0.5	1.2	5.0	1.0	1.0	1.8
Accessible for a fee	0.0	0.0	1.0	0.4	0.0	1.0	0.0	0.4
Not Responded	34.0	29.0	71.0	46.8	38.0	67.0	83.0	67.6

An analysis of the data according to the region did not change the dominant feature of inaccessibility. However, in the rural areas access to ICT after school hours was even less.

**Figure : H 25.2**  
**Access of Teachers & Students to Computers After School Hours as determined by Area**



This feature of inaccessibility was more pronounced in case of Government Schools in both Gujarat and Karnataka. However, Gujarat schools in the Government Sector were worse off than their Karnataka counter-parts.

**Table : H 25.3**  
**Access of Teachers & Students to Computers After School Hours according to Management of School**

Extent of Access	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
Never Accessible	26.2	44.5	16.0	32.0
Sometime Accessible	14.0	20.5	8.2	10.1
Always Accessible	0.7	1.7	1.5	2.4
Accessible for a fee	0.4	0.4	0.3	0.6
Not Responded	58.7	32.8	74.0	55.0

More schools in Gujarat claimed to be implementing the regional policy on ICT. Most of these were in Ahmedabad. In Karnataka it was Bangalore. This was possibly related to the easier and faster access to information in urban areas.

**Table : H 26.1**  
**Implementation of ICT Policy by Schools according to Area**

District/State	Urban	Semi-urban	Rural	Total
Ahmedabad	45.8	0.0	66.7	46.0
Patan	50.0	75.0	37.5	41.0
Surendranagar	0.0	31.3	3.6	8.0
<b>Gujarat</b>	<b>46.2</b>	<b>39.0</b>	<b>20.7</b>	<b>28.8</b>
Bangalore	24.1	75.0	22.2	30.0
Bellary	16.13	25.0	15.1	16.0
Mandya	10.6	10.0	11.3	11.0
<b>Karnataka</b>	<b>18.1</b>	<b>31.8</b>	<b>13.4</b>	<b>16.8</b>

Many more Private Schools in Gujarat claimed to be implementing the regional policy on ICT than Government Schools. Marginally more Government Schools in Karnataka claimed the same. There is possibly a deficiency in communicating the components of the policy framework to the schools which needs to be addressed.

**Table : H 26.2**  
**Implementation of ICT Policy as determined by management of Schools**

	<b>District/State</b>	<b>Government/Public</b>	<b>Private</b>
The method of implementing the policy on ICT in Education was	Ahmedabad	19.4	58.0
	Patan	26.3	62.2
	Surendranagar	2.5	16.7
	<b>Gujarat</b>	<b>14.8</b>	<b>45.4</b>
	Bangalore	29.4	30.6
	Bellary	18.7	11.7
	Mandya	12.7	4.7
	<b>Karnataka</b>	<b>17.5</b>	<b>15.4</b>

different in the two States. While in Gujarat the emphasis seemed to be on training teachers on ICT and then on using ICT in management and administration of the school, in Karnataka using ICT in teaching specific subjects was most important and then was the training of teachers. In both, the capital cities of Ahmedabad and Bangalore the pre-dominant emphasis was on using ICT in teaching specific subjects.

**Table : H 27.1**  
**Means of Implementing ICT Policy in Education**

<b>Means</b>	<b>GUJARAT</b>				<b>KARNATAKA</b>			
	<b>Ahmedabad</b>	<b>Patan</b>	<b>Surendra nagar</b>	<b>Total</b>	<b>Bangalore</b>	<b>Bellary</b>	<b>Mandya</b>	<b>Total</b>
Offering Separate Computer Course	17.0	4.0	4.5	6.8	15.0	7.5	4.5	7.8
Using ICT in Teaching Specific Subject	27.0	3.5	3.0	8.0	19.0	15.5	9.5	13.8
Using ICT in the Management and Administration of School	20.0	6.5	9.5	10.4	10.0	3.0	4.5	5.0
By Training Teachers on ICT	24.0	19.5	3.0	13.8	10.0	9.5	8.0	9.0

In both the States the relative emphasis on the different components of the policy did not change when analysed from the perspective of urban rural differentials.

**Table : H 27.2**  
**Means of Implementing ICT Policy in Education according to Area**

Means	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Offering Separate Computer Course	15.4	19.5	1.8	10.1	11.4	5.6
Using ICT in Teaching Specific Subject	22.3	7.3	2.4	16.5	15.9	11.6
Using ICT in the Management and Administration of School	18.5	19.5	6.1	8.0	0.0	3.7
By Training Teachers on ICT	23.8	17.1	9.4	8.5	9.1	9.3

In Karnataka, there was not much of a difference in the relative emphasis on the various methods on implementing the policies between Government and Private Schools. In Gujarat too while this was broadly true, the emphasis on using ICT in management and administration of schools was reflected in the data.

**Table : H 27.3**  
**Means of Implementing ICT Policy in Education as determined by Management of School**

Means	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
Offering Separate Computer Course	2.2	12.2	5.1	13.0
Using ICT in Teaching Specific Subject	2.2	14.8	13.6	14.2
Using ICT in the Management and Administration of School	3.3	18.8	5.1	4.7
By Training Teachers on ICT	10.0	18.3	10.6	5.9

**Table : H 27.4**  
**Means of Implementing ICT Policy in Education according to Academic Level**

Means	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Offering Separate Computer Course	2.8	11.0	3.3	12.1
Using ICT in Teaching Specific Subject	3.5	12.6	5.3	21.8
Using ICT in the Management and Administration of School	2.8	18.3	1.6	8.2
By Training Teachers on ICT	7.9	19.9	2.1	15.6

An analysis was made of the responses of the Heads of Schools to understand as to how ICT Courses or ICT based lessons and activities were offered in the schools. It was found that in both the States it was usually offered as a separate subject. In Karnataka however the emphasis on integrating ICT with other subjects was unmistakable as the second highest number of responses endorsed it. Interestingly, the number of hours spent in each school on integrating ICT with other subjects was maximum in both the States. In each of the 6 districts however, the proportion which reported that ICT was offered as a separate subject was maximum.

**Table : H 28.1**  
**Schools Offering ICT Courses & Average Hours Allotted**

	GUJARAT								KARNATAKA							
	Ahmedabad		Patan		Surendranagar		Total		Bangalore		Bellary		Mandya		Total	
	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours
School Offers ICT Course	34.0	0	10.0	0	5.0	0	12.8	0	19.0	0	16.0	0	14.5	0	16.0	0
As a Separate Subject	29.0	4	5.0	3	5.0	1	9.8	3	18.0	8	11.0	7	9.5	5	11.8	7
Integrated With Other Subjects	6.0	3	0.5	6	2.5	12	2.4	6	11.0	14	9.0	4	6.5	16	8.4	11
As an Elective Subject	5.0	0	0.5	1	1.5	0	1.8	1	0.0	0	3.5	1	3.0	3	2.6	2
Integrated with Elective Subject	3.0	3	0.0	1	0.0	4	0.6	3	0.0	0	3.0	4	3.0	3	2.4	3
As a Special Programme	5.0	0	4.5	1	0.0	10	2.8	0	1.0	0	1.0	0	2.0	0	1.4	0

An analysis of the data according to the rural and urban areas showed the same trend. The conclusion, therefore, was that there is a need for greater emphasis on integrating technology with education to derive maximum benefit.

**Table : H 28.2**  
**ICT Courses offered & Average Hours Allotted as determined by Area**

	GUJARAT								KARNATAKA							
	Urban		Semi-urban		Rural		Total		Urban		Semi-urban		Rural		Total	
	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours
School Offers ICT Course	26.9	0	19.5	0	6.4	0	12.8	0	20.2	0	15.9	0	13.1	0	16.0	0
As a Separate Subject	23.9	4	19.5	1	3.0	3	9.8	3	16.4	8	6.8	12	9.3	5	11.8	7
Integrated With Other Subjects	4.6	3	7.3	15	0.9	6	2.4	6	11.2	8	4.6	11	7.1	13	8.4	11
As an Elective Subject	3.9	0	4.9	1	0.6	1	1.8	1	2.7	0	9.1	17	1.5	0	2.6	2
Integrated with Elective Subject	2.3	3	0.0	0	0.0	3	0.6	3	3.2	2	2.3	6	1.9	3	2.4	3
As a Special Programme	3.9	0	0.0	0	2.7	1	2.8	0	2.1	0	0.0	0	1.1	0	1.4	0

In Gujarat it was found that most of the Government Schools provided ICT Courses as a special programme while the maximum number of Private Schools offered ICT as a separate subject. The emphasis on integration with other subjects was however discernible in the case of Private Schools in Gujarat. There was no difference in the mode of offering ICT Courses or ICT based activities between Private and Government Schools in Karnataka. Most offered them first as a separate and then integrated with other subjects. The emphasis on integrating technology was however apparent. The maximum number of hours spent on integrating ICT with other subjects was in Government Schools in Karnataka while in Private Schools it was on dealing with it as a separate subject.

**Table : H 28.3**  
**ICT Courses offered and Average Hours Allotted as determined by**  
**Management of Schools**

	GUJARAT						KARNATAKA					
	Government/ Public		Private		Total		Government/ Public		Private		Total	
	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours
School Offers ICT Course	6.3	0	20. 5	0	12.8	0	15.4	0	17.2	0	16. 0	0
As a Separate Subject	1.9	1	19. 2	4	9.8	3	10.6	6	14.2	8	11. 8	7
Integrated With Other Subjects	0.4	7	4.8	5	2.4	6	8.5	14	8.3	4	8.4	11
As an Elective Subject	1.1	2	2.6	0	1.8	1	2.1	2	3.6	0	2.6	2
Integrated with Elective Subject	0.0	4	1.3	2	0.6	3	1.8	1	3.6	6	2.4	3
As a Special Programme	4.0	1	1.3	0	2.8	0	1.8	0	0.6	0	1.4	0

An assessment of the information according the grade of the school did not change the picture whether in Gujarat or in Karnataka.

**Table : H 28.4**  
**ICT Courses offered & Average Hours Allotted as determined by Academic Level**

	GUJARAT										KARNATAKA									
	Primary		Secondary		Post Secondary		Total Column (3+5)	Total Column (4+6)	Total		Primary		Secondary		Post Secondary		Total Column (13+15)	Total Column (14+16)	Total	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	%	Mean Hours	%	Mean Hours	%	Mean Hours			%	Mean Hours	%	Mean Hours	%	Mean Hours	%	Mean Hours			%	Mean Hours
School Offers ICT Course	6.7	0	10.1	0	38.5	0	24.3	0	12.8	0	7	0	24.3	0	50	0	37.15	0	16	0
As a Separate Subject	2.4	1	9.5	4	34.6	4	22.05	4	9.8	3	5.8	5	17.3	7	50	0	33.65	3.5	11.8	7
Integrated With Other Subjects	0.4	3	3.6	14	6.4	3	5	8.5	2.4	6	2.9	9	13.3	11	50	0	31.65	5.5	8.4	11
As an Elective Subject	0.4	1	2.4	1	5.1	1	3.75	1	1.8	1	1.7	0	3.1	2	50	0	26.55	1	2.6	2
Integrated with Elective Subject	0	1	0.6	5	2.6	2	1.6	3.5	0.6	3	1.2	2	3.1	3	50	0	26.55	1.5	2.4	3
As a Special Programme	4.3	1	1.2	0	1.3	0	1.25	0	2.8	0	1.2	0	1.2	0	50	0	25.6	0	1.4	0

An assessment of the classes or subjects for which computers and related technologies were used was made. It was found that they were used most for teaching ICT as a subject. They were used least for teaching the local language. The maximum percentage of respondents who stated that a subject for which computers were always used was ICT-both in Gujarat (8.2%) and in Karnataka (11.8%). This starkly brings to notice the low level of integration of technology into the various subjects and specially in social sciences and languages.

**Table : H 29.1  
Frequency of Use of ICT in Various Subjects**

Usage in	Frequency	GUJARAT				KARNATAKA			
		Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
ICT subject	Always	25.0	1.5	6.5	8.2	27.0	9.0	7.0	11.8
	A lot sometimes	4.0	35.5	0.5	15.2	4.0	4.5	3.0	3.8
	Rarely	3.0	3.5	0.0	2.0	3.0	0.5	1.0	1.2
	Never	13.0	39.0	7.0	21.0	3.0	2.0	0.5	1.6
	Not responded	55.0	20.5	86.0	53.6	63.0	84.0	88.5	81.6
Mathematics	Always	11.0	1.0	2.5	3.6	12.0	5.0	5.0	6.4
	A lot sometimes	16.0	35.5	1.5	18.0	12.0	8.5	5.5	8.0
	Rarely	6.0	7.0	0.0	4.0	3.0	0.5	1.5	1.4
	Never	7.0	36.5	6.5	18.6	2.0	2.0	1.0	1.6
	Not responded	60.0	20.0	89.5	55.8	71.0	84.0	87.0	82.6
Science	Always	14.0	2.0	6.5	6.2	12.0	4.5	5.0	6.2
	A lot sometimes	11.0	42.0	0.5	19.2	13.0	8.0	4.0	7.4
	Rarely	10.0	6.5	0.0	4.6	4.0	1.0	2.0	2.0
	Never	7.0	29.5	6.5	15.8	2.0	2.0	1.0	1.6
	Not responded	58.0	20.0	86.5	54.2	69.0	84.5	88.0	82.8
Social science	Always	10.0	0.5	4.0	3.8	6.0	4.5	4.5	4.8
	A lot sometimes	9.0	33.5	0.0	15.2	9.0	6.5	3.5	5.8
	Rarely	6.0	7.0	0.0	4.0	2.0	0.5	2.0	1.4
	Never	7.0	38.0	7.0	19.4	4.0	2.0	1.5	2.2
	Not responded	68.0	21.0	89.0	57.6	79.0	86.5	88.5	85.8

**Table : H 29.1 (Continued)**  
**Frequency of Use of ICT in Various Subjects**

Usage in	Frequency	GUJARAT				KARNATAKA			
		Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Local language	Always	10.0	0.5	2.0	3.0	1.0	2.5	1.0	1.6
	A lot sometimes	9.0	40.0	0.0	17.8	7.0	1.5	1.5	2.6
	Rarely	4.0	6.5	0.0	3.4	3.0	0.5	1.0	1.2
	Never	8.0	32.5	7.0	17.4	4.0	2.5	2.0	2.6
	Not responded	69.0	20.5	91.0	58.4	85.0	93.0	94.5	92.0
English	Always	10.0	2.0	1.0	3.2	6.0	3.5	1.0	3.0
	A lot sometimes	8.0	40.5	0.0	17.8	8.0	3.5	1.5	3.6
	Rarely	3.0	8.0	0.0	3.8	4.0	1.0	1.5	1.8
	Never	8.0	28.0	7.0	15.6	5.0	2.5	2.0	2.8
	Not responded	71.0	21.5	92.0	59.6	77.0	89.5	94.0	88.8
Art	Always	12.0	0.5	1.0	3.0	9.0	4.0	1.5	4.0
	A lot sometimes	8.0	38.5	0.0	17.0	1.0	3.0	3.0	2.6
	Rarely	4.0	3.5	0.0	2.2	7.0	0.5	1.5	2.2
	Never	8.0	35.5	7.0	18.6	3.0	2.5	1.5	2.2
	Not responded	68.0	22.0	92.0	59.2	80.0	90.0	92.5	89.0
Music	Always	9.0	1.0	2.0	3.0	4.0	3.0	1.5	2.6
	A lot sometimes	6.0	37.0	0.5	16.2	2.0	2.5	1.5	2.0
	Rarely	4.0	6.0	0.0	3.2	5.0	1.5	0.5	1.8
	Never	8.0	34.0	7.0	18.0	5.0	2.5	2.0	2.8
	Not responded	73.0	22.0	90.5	59.6	84.0	90.5	94.5	90.8

Assessing the data from the rural-urban prospective it was found that in Gujarat while Science & Mathematics remained important in both areas, as subjects where ICT was extensively used, it was English which was the second most popular subject for ICT usage in rural Gujarat. This was possibly due to the felt need to learn English in the villages. In both rural & urban Karnataka it were the subjects of ICT, Science & Mathematics which were most popular for ICT integration. Interestingly, however, the

order of popularity was reverse between the two areas. In the urban areas of both Gujarat & Karnataka it was Music where the least integration took place.

**Table : H 29.2**  
**Frequency of Use of ICT in Various Subjects according to Area**

Usage in	Frequency	Gujarat			Karnataka		
		Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
ICT subject	Always	18.5	24.4	2.1	17.6	20.5	6.3
	A lot sometimes	10.0	7.3	18.2	4.3	4.5	3.4
	Rarely	2.3	0.0	2.1	2.1	0.0	0.7
	Never	22.3	9.8	21.9	1.1	0.0	2.2
	Not responded	46.9	58.5	55.6	75.0	75.0	87.3
Mathematics	Always	7.7	0.0	2.4	7.4	11.4	4.9
	A lot sometimes	15.4	14.6	19.5	9.6	9.1	6.7
	Rarely	6.2	0.0	3.6	0.5	4.5	1.5
	Never	19.2	12.2	19.1	1.1	0.0	2.2
	Not responded	51.5	73.2	55.3	81.4	75.0	84.7
Science	Always	10.8	9.8	4.0	7.4	11.4	4.5
	A lot sometimes	14.6	12.2	21.9	9.0	6.8	6.3
	Rarely	10.0	2.4	2.7	2.1	4.5	1.5
	Never	14.6	9.8	17.0	1.1	0.0	2.2
	Not responded	50.0	65.9	54.4	80.3	77.3	85.4
Social science	Always	7.7	7.3	1.8	5.3	4.5	4.5
	A lot sometimes	10.0	7.3	18.2	6.9	0.0	6.0
	Rarely	6.2	0.0	3.6	1.6	0.0	1.5
	Never	19.2	12.2	20.4	1.1	4.5	2.6
	Not responded	56.9	73.2	55.9	85.1	90.9	85.4
Local language	Always	7.7	2.4	1.2	1.6	0.0	1.9
	A lot sometimes	14.6	4.9	20.7	5.3	0.0	1.1
	Rarely	4.6	2.4	3.0	1.6	0.0	1.1
	Never	15.4	14.6	18.5	1.1	4.5	3.4
	Not responded	57.7	75.6	56.5	90.4	95.5	92.5

**Table : H 29.2 (Continued)**  
**Frequency of Use of ICT in Various Subjects according to Area**

Usage in	Frequency	Gujarat			Karnataka		
		Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
English	Always	9.2	0.0	1.2	4.3	2.3	2.2
	A lot sometimes	9.2	4.9	22.8	6.4	0.0	2.2
	Rarely	5.4	0.0	3.6	2.1	4.5	1.1
	Never	15.4	14.6	15.8	1.1	4.5	3.7
	Not responded	60.8	80.5	56.5	86.2	88.6	90.7
Art	Always	9.2	0.0	0.9	4.8	2.3	3.7
	A lot sometimes	10.0	7.3	21.0	2.7	2.3	2.6
	Rarely	3.1	0.0	2.1	3.7	4.5	0.7
	Never	20.0	12.2	18.8	1.1	0.0	3.4
	Not responded	57.7	80.5	57.1	87.8	90.9	89.6
Music	Always	7.7	4.9	0.9	3.2	0.0	2.6
	A lot sometimes	8.5	9.8	20.1	2.1	2.3	1.9
	Rarely	3.8	0.0	3.3	2.7	4.5	0.7
	Never	18.5	12.2	18.5	1.1	4.5	3.7
	Not responded	61.5	73.2	57.1	91.0	88.6	91.0

In Gujarat, it was the subject of Science which was most integrated both in the private as well as government schools. In Karnataka, however, while government schools gave importance to Mathematics, it was ICT as a subject which was most popular in private schools. Music remained the least important from the point of view of technology integration for both Gujarat & Karnataka government schools. Similarly placed was Art in private schools in Gujarat and the local language in Karnataka private schools.

**Table : H 29.3**  
**Frequency of Use of ICT in Various Subjects as determined**  
**by School Management**

Usage in	Frequency	Gujarat		Karnataka	
		Government /Public	Private	Government /Public	Private
ICT subject	Always	1.5	16.2	8.2	18.9
	A lot sometimes	21.8	7.4	2.7	5.9
	Rarely	1.1	3.1	1.2	1.2
	Never	18.8	23.6	1.8	1.2
	Not responded	56.8	49.8	86.1	72.8
Mathematics	Always	1.8	5.7	6.0	7.1
	A lot sometimes	21.4	14.0	6.6	10.7
	Rarely	3.3	4.8	1.5	1.2
	Never	16.2	21.4	1.8	1.2
	Not responded	57.2	54.1	84.0	79.9
Science	Always	2.6	10.5	5.7	7.1
	A lot sometimes	23.2	14.4	6.0	10.1
	Rarely	1.1	8.7	1.8	2.4
	Never	16.6	14.8	1.8	1.2
	Not responded	56.5	51.5	84.6	79.3
Social science	Always	1.5	6.6	6.0	2.4
	A lot sometimes	20.7	8.7	5.7	5.9
	Rarely	2.6	5.7	1.5	1.2
	Never	17.7	21.4	2.1	2.4
	Not responded	57.6	57.6	84.6	88.2
Local language	Always	1.1	5.2	1.2	2.4
	A lot sometimes	22.5	12.2	2.1	3.6
	Rarely	1.5	5.7	1.5	0.6
	Never	16.6	18.3	3.0	1.8
	Not responded	58.3	58.5	92.1	91.7
English	Always	1.1	5.7	1.5	5.9
	A lot sometimes	22.1	12.7	2.7	5.3
	Rarely	1.8	6.1	1.2	3.0
	Never	15.9	15.3	3.3	1.8
	Not responded	59.0	60.3	91.2	84.0
Art	Always	1.1	5.2	2.7	6.5
	A lot sometimes	21.8	11.4	2.1	3.6
	Rarely	1.5	3.1	1.8	3.0
	Never	17.0	20.5	3.0	0.6
	Not responded	58.7	59.8	90.3	86.4

**Table : H 29.3 (Continued)**  
**Frequency of Use of ICT in Various Subjects as determined**  
**by School Management**

Usage in	Frequency	Gujarat		Karnataka	
		Government /Public	Private	Government /Public	Private
Music	Always	0.7	5.7	1.5	4.7
	A lot sometimes	21.0	10.5	1.8	2.4
	Rarely	2.2	4.4	1.2	3.0
	Never	16.6	19.7	3.3	1.8
	Not responded	59.4	59.8	92.1	88.2

Both primary and secondary schools in Gujarat used Computers and related technologies most for the subject of Science. ICT as a subject was important in the secondary schools of Gujarat. Surprisingly, primary schools in Gujarat utilized technology for Art more than for Social Science or English. As far as Karnataka was concerned, primary schools utilized technology most for ICT and Mathematics while it was Science and Mathematics for secondary schools.

**Table : H 29.4**  
**Frequency of Use of ICT in Various Subjects as per Academic Level**

Usage in	Frequency	Gujarat		Karnataka	
		Primary	Secondary	Primary	Secondary
ICT subject	Always	2.0	14.6	6.2	17.1
	A lot sometimes	21.7	8.5	2.5	5.1
	Rarely	0.0	4.1	0.0	2.3
	Never	14.2	28.0	1.6	1.6
	Not responded	62.2	44.7	89.7	73.9
Mathematics	Always	1.2	6.1	2.1	10.5
	A lot sometimes	24.0	11.8	2.9	12.8
	Rarely	0.8	7.3	0.0	2.7
	Never	12.2	25.2	1.6	1.6
	Not responded	61.8	49.6	93.4	72.4
Science	Always	2.8	9.8	1.6	10.5
	A lot sometimes	23.2	15.0	2.5	12.1
	Rarely	0.8	8.5	0.4	3.5
	Never	12.2	19.5	1.6	1.6
	Not responded	61.0	47.2	93.8	72.4

**Table : H 29.4 (continued)**  
**Frequency of Use of ICT in Various Subjects as per Academic Level**

Social science	Always	1.6	6.1	1.2	8.2
	A lot sometimes	22.4	7.7	0.8	10.5
	Rarely	0.4	7.7	0.0	2.7
	Never	13.0	26.0	2.1	2.3
	Not responded	62.6	52.4	95.9	76.3
Local language	Always	2.0	4.1	0.8	2.3
	A lot sometimes	22.4	13.0	0.0	5.1
	Rarely	0.4	6.5	0.4	1.9
	Never	13.0	22.0	2.1	3.1
	Not responded	62.2	54.5	96.7	87.5
English	Always	2.0	4.5	1.6	4.3
	A lot sometimes	21.7	13.8	1.2	5.8
	Rarely	0.4	7.3	0.8	2.7
	Never	12.6	18.7	1.6	3.9
	Not responded	63.4	55.7	94.7	83.3
Art	Always	2.4	3.7	2.1	5.8
	A lot sometimes	22.4	11.4	1.6	3.5
	Rarely	0.4	4.1	1.2	3.1
	Never	12.6	24.8	1.2	3.1
	Not responded	62.2	56.1	93.8	84.4
Music	Always	2.0	4.1	1.2	3.9
	A lot sometimes	22.0	10.2	1.6	2.3
	Rarely	0.8	5.7	0.8	2.7
	Never	12.2	24.0	1.6	3.9
	Not responded	63.0	56.1	94.7	87.2

The number of PCs or the number of teachers trained does not provide an adequate assessment of the impact of using ICT in schools. What is the important is the purpose for which ICT is being used, for it could be used only for helping the school administration, which would obviously not have any impact on the learning process. Twelve different purposes for using ICT were identified ranging from learning enrichment to communicating to playing games etc. It was found that the three purposes, which had the maximum response, was similar in the two States.

While in Gujarat the maximum usage was for

1. Teaching-learning tool for teaching specific subjects.
2. Helping school administration.
3. Learning enrichment or learning new things.

In Karnataka these were

1. Regular instruction/training for developing computer skills.
2. Learning enrichment or learning new things.
3. Helping school administration.

ICT was least used for finding/assessing information and researching through Internet in Gujarat and for communicating with others in Karnataka. This possibly was directly related to the lack of access to the Internet by most schools and students in the country. In Ahmedabad, the maximum percentage of schools used ICT for learning enrichment or learning new things. In Patan it was for teaching-learning tool for teaching specific subjects while in Surendranagar it was used as a teaching-learning tool and for helping school administration in equal measure. In Bangalore, Bellary and Mandya the maximum number of schools reported using ICT for regular instruction/training for developing computer skills. Karnataka schools were, therefore, more oriented towards developing computer skills and not towards integration of technology into the education process.

**Table : H 30.1**  
**Purpose of Using ICT by Teachers**

Purpose of Using ICT	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Learning enrichment or learning new things	28.0	22.0	3.0	15.6	16.0	12.5	10.0	12.2
Remedial learning	9.0	8.0	1.5	5.6	5.0	5.0	3.0	4.2
Regular instruction/training for developing computer skills	19.0	10.0	4.5	9.6	34.0	15.0	10.0	16.8
Finding/accessing information and researching through internet	12.0	1.5	0.0	3.0	10.0	3.5	4.5	5.2
Communicating with others	8.0	4.0	0.5	3.4	3.0	2.5	3.0	2.8
Teaching learning tool for teaching specific subjects	19.0	24.5	8.5	17.0	15.0	10.5	10.0	11.2
Development of logic, reasoning, critical thinking etc.	12.0	4.0	1.5	4.6	9.0	4.5	4.0	5.2
Ability to use basic application programs	17.0	6.5	1.0	6.4	13.0	12.5	8.5	11.0
Playing games and fun	21.0	17.0	2.5	12.0	16.0	11.5	6.5	10.4
Helping school administration	21.0	23.0	8.5	16.8	20.0	9.5	9.0	11.4
Test administration, scoring and analysis	15.0	21.5	1.0	12.0	7.0	6.5	7.5	7.0
Tracking of student performance levels	7.0	7.5	2.0	5.2	3.0	4.5	3.0	3.6

Examining the data according to the region it was found that in both urban and rural areas of Gujarat the most popular uses of ICT were similar though the ranking were different. In urban Gujarat the maximum usage was for:-

1. Learning enrichment or learning new things.
2. Helping school administration.
3. Teaching-learning tool for teaching specific subjects/ Playing games and fun.

In rural Gujarat the most popular activities were

1. Teaching-learning tools for teaching specific subjects.
2. Helping school administration.
3. Learning enrichment or learning new things.

In Karnataka the two most popular purposes of using ICT were similar though the third one was different. In urban Karnataka these were

1. Regular instruction/training for developing computer skills.
2. Learning enrichment or learning new things.
3. Helping school administration.

In rural Karnataka schools the most popular activities were

1. Learning enrichment or learning new things.
2. Regular instruction/training for developing computer skills/ Ability to use basic application programmes.
3. Teaching-learning tools for teaching specific subjects.

This perhaps shows that a lesser number of rural Karnataka schools have PCs in their offices.

**Table : H 30.2**  
**Purpose of Use of ICT as determined by Area**

Purpose	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Learning enrichment or learning new things	28.5	9.8	11.2	16.0	2.3	11.2
Remedial learning	10.8	0.0	4.3	5.3	2.3	3.7
Regular instruction/training for developing computer skills	17.7	17.1	5.5	21.8	31.8	10.8
Finding/accessing information and researching through internet	11.5	0.0	0.0	6.4	4.5	4.5
Communicating with others	10.0	0.0	1.2	2.1	2.3	3.4
Teaching learning tool for teaching specific subjects	21.5	29.3	13.7	12.8	11.4	10.1
Development of logic, reasoning, critical thinking etc.	11.5	4.9	1.8	7.4	4.5	3.7
Ability to use basic application programs	14.6	4.9	3.3	11.2	11.4	10.8
Playing games and fun	21.5	7.3	8.8	13.8	4.5	9.0
Helping school administration	26.2	19.5	12.8	15.4	9.1	9.0
Test administration, scoring and analysis	20.0	12.2	8.8	7.4	2.3	7.5
Tracking of student performance levels	9.2	4.9	3.6	4.3	2.3	3.4

By far the most important usage in Gujarat Private Schools is for helping the school administration. The rest of the two most popular purposes are similar to that of Government Schools. In Karnataka, however there is a discernable difference in the purposes to which ICT is put in Private and Government Schools. While at one end Private Schools use it most for regular instruction/training for developing computer skills and next for playing games and fun, Government Schools use it most as a teaching-learning tool for teaching specific subjects, to inculcate the ability to use basic application programmes and then for learning enrichment. Interestingly, while there is a broad similarity in the purpose of using ICT in Government Schools in both the States, there is a difference between Private Schools in the two States.

**Table : H 30.3**  
**Purpose of Use of ICT according to Management of Schools**

Purpose	Gujarat		Karnataka	
	Government /Public	Private	Government / Public	Private
Learning enrichment or learning new things	8.9	23.6	12.4	11.8
Remedial learning	3.0	8.7	4.2	4.1
Regular instruction/training for developing computer skills	4.1	16.2	15.1	20.1
Finding/accessing information and researching through internet	1.1	5.2	6.0	3.6
Communicating with others	1.8	5.2	3.6	1.2
Teaching learning tool for teaching specific subjects	11.4	23.6	12.7	8.3
Development of logic, reasoning, critical thinking etc.	1.5	8.3	6.0	3.6
Ability to use basic application programs	3.0	10.5	12.7	7.7
Playing games and fun	6.3	18.8	9.1	13.0
Helping school administration	6.3	29.3	11.5	11.2
Test administration, scoring and analysis	5.9	19.2	8.5	4.1
Tracking of student performance levels	3.3	7.4	4.5	1.8

In Gujarat, the most popular reasons of using ICT differ between Primary and Secondary Schools. However, there is no such difference between Primary and Secondary Schools in Karnataka. Surprisingly, there is a difference between the more popular usage of ICT between Primary Schools in Gujarat and Primary Schools in Karnataka. While Primary Schools in Karnataka emphasise developing computer skills, the ones in Gujarat use it as a teaching-learning tool for teaching specific subjects. This difference is ascertainable in the Secondary School Sector in the two States also.

**Table : H 30.4**  
**Purpose of Using ICT as per Academic Level taught**

Purpose	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Learning enrichment or learning new things	4.7	26.8	4.5	19.5
Remedial learning	1.2	10.2	0.8	7.4
Regular instruction/training for developing computer skills	3.5	15.9	7.4	25.7
Finding/accessing information and researching through internet	1.6	4.5	1.6	8.6
Communicating with others	2.0	4.9	0.0	5.4
Teaching learning tool for teaching specific subjects	7.1	27.2	3.7	18.3
Development of logic, reasoning, critical thinking etc.	2.0	7.3	0.8	9.3
Ability to use basic application programs	2.4	10.6	2.5	19.1
Playing games and fun	3.1	21.1	4.5	16.0
Helping school administration	3.1	30.9	4.5	17.9
Test administration, scoring and analysis	2.0	22.4	1.2	12.5
Tracking of student performance levels	1.6	8.9	1.2	5.8

Most of the schools do not collect any fee for providing ICT tools. While different formulations of the fee structure could be made ranging from general to specified purpose to use of different components/services provided by ICT tools, it was found that the most popular method of collecting fee in the matter was 'computer fee in general'. There was hardly any fee collected for use of the Internet after class possibly because of its non-availability.

**Table : H 31.1**  
**Purpose of Computer Fee Collection by Schools**

Purpose	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Computer fee in general	47.0	14.0	3.5	16.4	27.0	8.0	2.5	9.6
Fees for computer courses	7.0	0.5	0.5	1.8	3.0	1.5	0.0	1.2
Fees for use of computers after class by students	8.0	4.5	2.0	4.2	2.0	0.5	0.5	0.8
Fees for use of internet after class by students	2.0	1.5	1.5	1.6	0.0	0.0	0.0	0.0
Fees for use of computers by non-formal classes	0.0	0.5	1.0	0.6	0.0	0.0	0.0	0.0

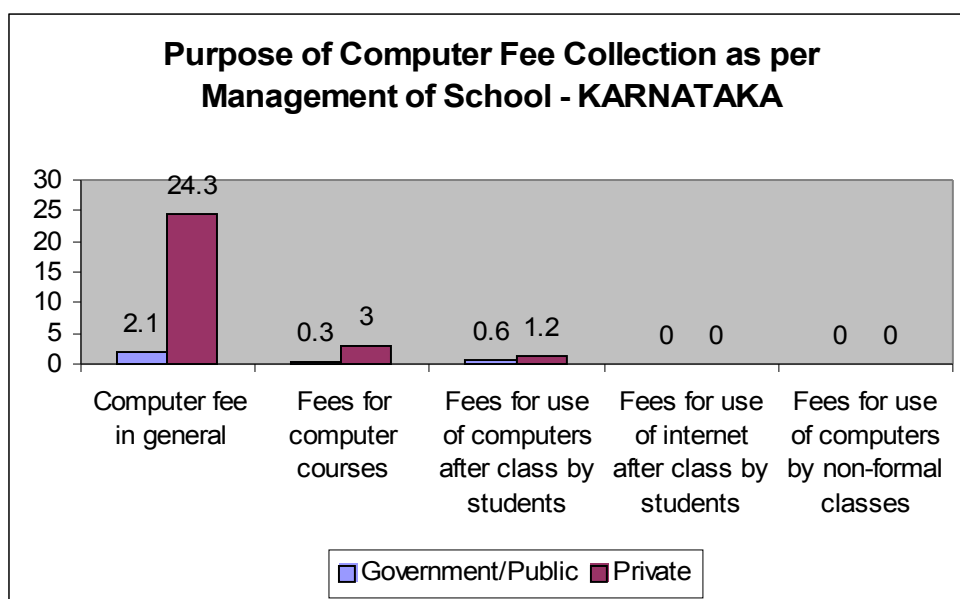
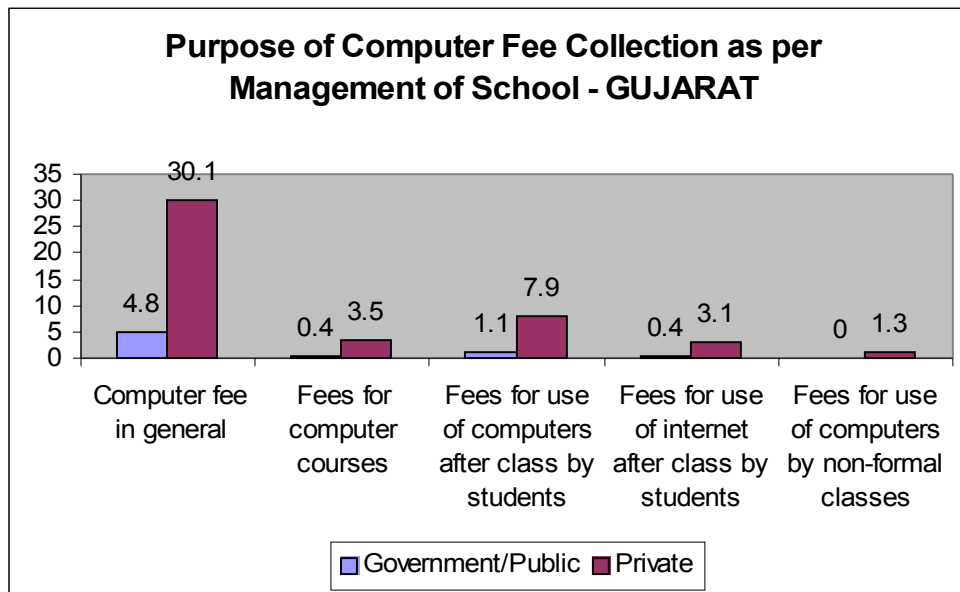
There was more incidents of charging of fee in urban areas than in the rural areas. However, the most common formulation remained 'computer fee in general' in both the urban and rural areas.

**Table : H 31.2**  
**Purpose of Computer Fee Collection as determined by Area**

Purpose	A.	Gujarat			Karnataka		
		Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Computer fee in general		42.3	22.0	5.5	17.0	20.5	2.6
Fees for computer courses		4.6	0.0	0.9	2.7	0.0	0.4
Fees for use of computers after class by students		6.9	7.3	2.7	1.6	0.0	0.4
Fees for use of internet after class by students		1.5	4.9	1.2	0.0	0.0	0.0
Fees for use of computers by non-formal classes		0.0	4.9	0.3	0.0	0.0	0.0

In Private schools in Gujarat there was at least a 6 times more instance of charging of fee as compared to Government Schools. In Karnataka this ratio went up even further. However, the maximum incidence of fee charged was for computers in general.

**Figure : H 31.3**



Not surprisingly more Secondary Schools charged fee for providing ICT facilities in both the States. However, 'computer fee in general' remained the most popular method across both the Primary and Secondary Sectors in the two States.

**Table : H 31.4**  
**Purpose of Computer Fee Collection according to Academic Level**

Purpose	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Computer fee in general	5.9	27.2	6.6	12.5
Fees for computer courses	0.8	2.8	0.8	1.6
Fees for use of computers after class by students	1.6	6.9	0.8	0.8
Fees for use of internet after class by students	0.4	2.8	0.0	0.0
Fees for use of computers by non-formal classes	0.0	1.2	0.0	0.0

As the level of internet connectivity was very low, a large enough sample was not available to analyse the responses to Q. nos. 32, 33 and 34.

However, an assessment of the source of funds for payment of Internet connection found that it was the school which in most cases provided for it via tuition fee collection. The local Government or the State Government was the second most important source. The Constitutional position of a limited role of the National Government in the Secondary Sector was mirrored in the fact that a very insignificant proportion of the total funds were provided by the National Government. The Parents-Teachers Association (PTA) were the least important source in both the States which does not speak very highly of community involvement. The school trust was an important source in Ahmedabad while the State Government was an important source in Patan.

**Table : H 35.1**  
**Source of Payment for Internet Connection**

Source	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
School via tuition fee collection	18.0	36.0	2.5	19.0	38.0	17.5	12.0	19.4
Local govt. through school board	2.0	33.5	1.5	14.4	11.0	1.0	5.0	4.6
National govt. as included in the budget	0.0	0.5	0.0	0.2	1.0	4.5	0.5	2.2
Parents-teachers' association	2.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Others (school trust)	7.0	0.0	0.0	1.4	3.0	1.0	2.5	2.0

There was not much difference in the matter when assessed from the regional angle.

**Table : H 35.2**  
**Source of Payment for Internet Connection according to Area**

Source	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
School via tuition fee collection	19.2	12.2	19.8	30.3	20.5	11.6
Local govt. through school board	6.9	4.9	18.5	6.4	6.8	3.0
National govt. as included in the budget	0.0	0.0	0.3	1.6	2.3	2.6
Parents-teachers' association	0.8	0.0	0.3	0.0	0.0	0.0
Others (school trust)	5.4	0.0	0.0	2.1	0.0	2.2

In Government Schools in Gujarat, the School as well as the State Government were both important sources of payment for Internet connectivity. This was true for Private Schools also. In Karnataka, however, the local Government/State Government was much less important.

**Table : H 35.3**  
**Source of Payment for Internet Connection as determined**  
**by Management of School**

Source of Payment for Internet Connection	B. Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
School via tuition fee collection	14.8	24.0	15.7	26.6
Local govt. through school board	14.0	14.8	6.3	1.2
National govt. as included in the budget	0.4	0.0	3.0	0.6
Parents-teachers' association	0.4	0.4	0.0	0.0
Others (school trust)	0.4	2.6	2.7	0.6

The fact that it was the schools which were the most important source of payment for Internet connectivity via tuition fee collection was also vindicated when Primary and Secondary Schools were compared separately.

**Table : H 35.4**  
**Source of Payment for Internet Connection as per Academic Level**

Source	C. Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
School via tuition fee collection	12.6	25.6	6.6	31.5
Local govt. through school board	11.0	17.9	0.4	8.6
National govt. as included in the budget	0.4	0.0	0.0	4.3
Parents-teachers' association	0.4	0.4	0.0	0.0
Others (school trust)	0.4	2.4	0.0	3.9

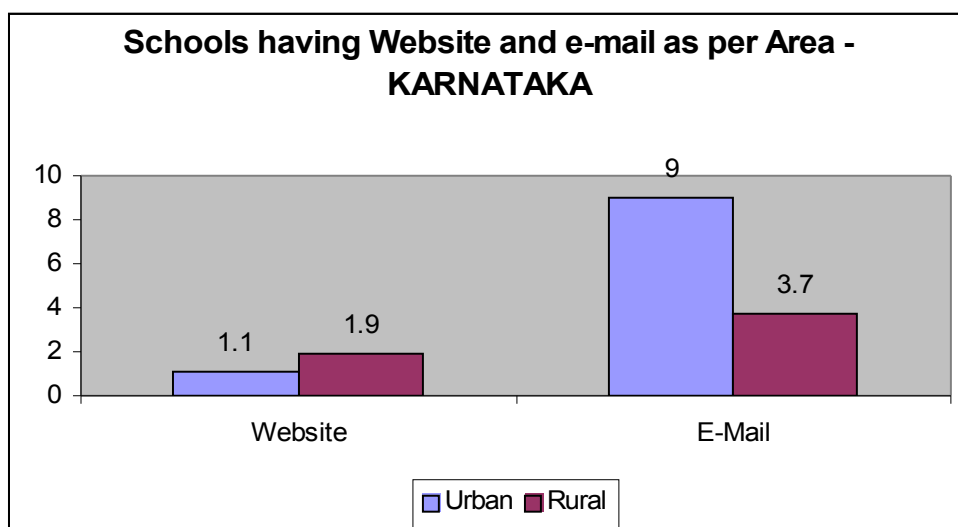
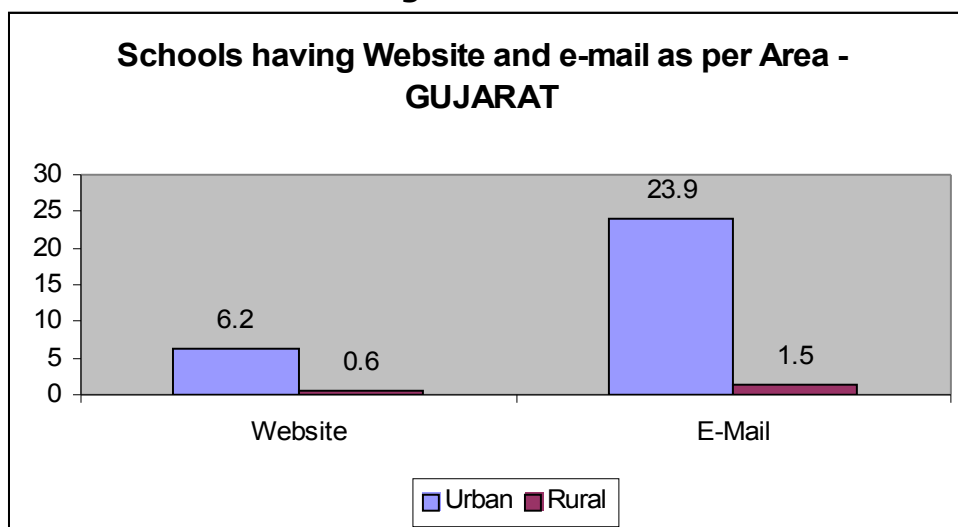
The number of schools which had their own website or E-mail addresses was very low. Only 2% of Gujarat schools had a website and only 8% had an E-mail address. In Karnataka, the respective figures were 1.4% and 6.2%. Thus, Gujarat schools were better placed. The best District was Ahmedabad on both counts. The fact that 29% of schools in Ahmedabad had an E-mail address was indeed heartening.

**Table : H 36.1**  
**Schools having Website and E-mail**

	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Website	9.0	0.0	0.5	2.0	2.0	1.5	1.0	1.4
E-mail	29.0	3.5	2.0	8.0	16.0	1.0	6.5	6.2

It did not come as a surprise to find that more urban schools in both the States had websites and E-mail addresses. What was surprising to find was that the number of websites in rural Karnataka were marginally more than their urban counter-parts.

**Figure : H 36.2**



An assessment of the adoption of ICT by Private and Government Schools found that in Gujarat not a single Government School had a website. There were stark variations between the two sectors in Gujarat in this matter. Interestingly, it seems that more Government Schools in Karnataka have websites and E-mail IDs.

**Table : H 36.3**  
**Schools having Website and E-mail according to Management of Schools**

	GUJARAT		KARNATAKA	
	Government /Public	Private	Government /Public	Private
Website	0.0	4.4	1.8	0.6
E-mail	1.11	16.16	6.7	5.3

Secondary School teachers and students are more accomplished and, therefore had a larger number of websites and E-mail addresses. None of the Primary Schools surveyed in Karnataka had a website.

**Table : H 36.4**  
**Schools having Website and E-mail according to Academic Level**

	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Website	1.2	2.9	0.0	2.7
E-mail	3.2	13.0	0.8	11.3

Possibly, the most crucial determinant of effectiveness of ICT in education is access to and quality of educational software applications in schools. Our survey showed that a larger number of Karnataka schools had access to such content. As far as individual Districts were concerned Ahmedabad was at number one and Bangalore came next. The least number of schools with access to educational software was Surendranagar. More Gujarat Schools had a code of conduct in place for using computers and Internet, with Ahmedabad leading the way.

**Table : H 37.1**  
**Schools with Educational S/W Applications and**  
**Code of Conduct for use of Computers and Internet**

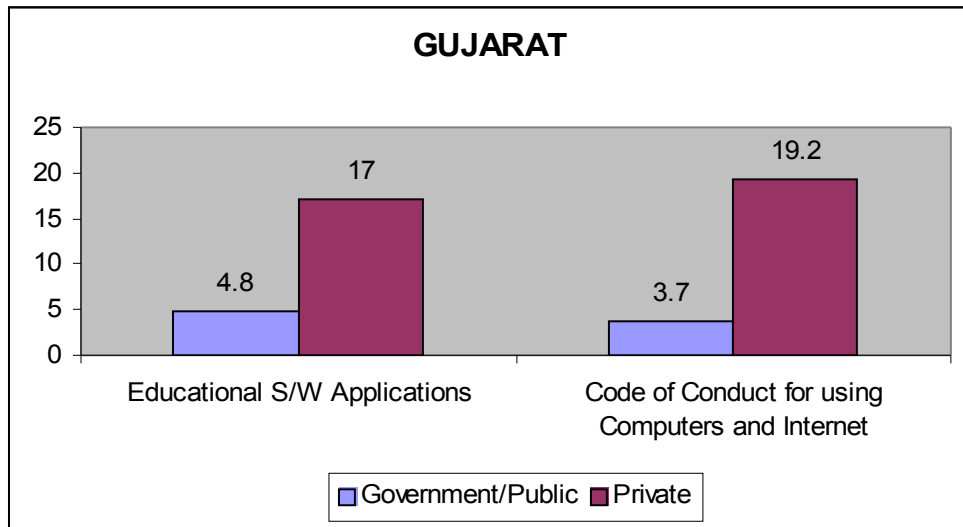
	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Educational S/W Applications	31.0	7.0	3.5	10.4	27.0	16.0	11.0	16.2
Code of Conduct for using Computers and Internet	23.0	13.5	2.0	10.8	17.0	7.5	7.0	9.2

**Table : H 37.2**  
**Schools with Educational S/W Applications and**  
**Code of Conduct as per Area**

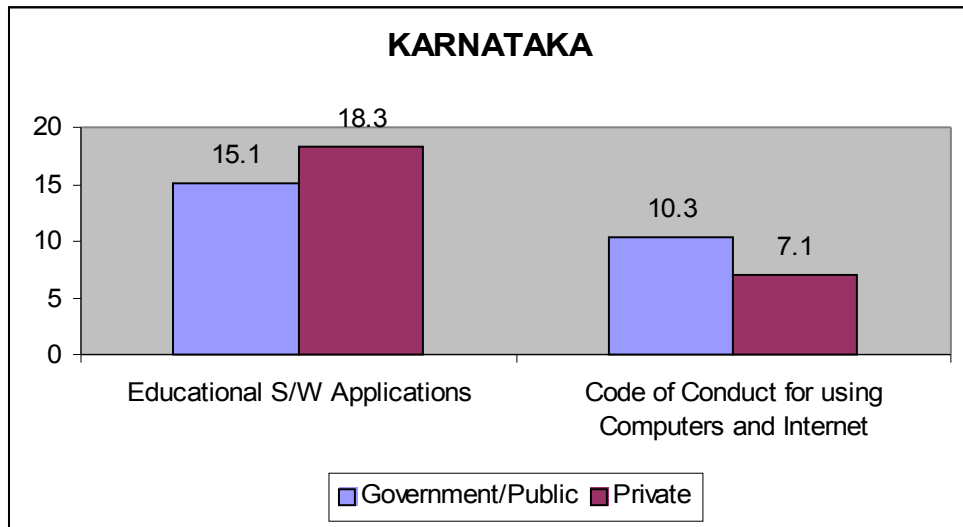
	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Educational S/W Applications	26.2	7.3	4.6	19.9	22.7	12.7
Code of Conduct for using Computers and Internet	22.3	7.3	6.7	12.8	11.4	6.3

It were the Private Schools in both the States which had better access to educational software applications when compared to Government Schools. This is an issue which would need the urgent intervention of the authorities. More Private Schools in Gujarat had a code of conduct for using computers and Internet but in Karnataka it was the reverse.

**Figure : H 37.3**  
**Schools with Educational S/W Applications and**  
**Code of Conduct as determined by Management of Schools**



**Schools with Educational S/W Applications and**  
**Code of Conduct as determined by Management of Schools**



More Secondary Schools in both Karnataka and Gujarat had access to educational content and had a code of conduct in place.

**Table : H 37.4**  
**Schools with Educational S/W Applications and**  
**Code of Conduct according to Academic Level**

	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Educational S/W Applications	4.7	16.3	5.4	26.5
Code of Conduct for using Computers and Internet	2.8	19.1	2.1	16.0

An assessment was finally made of the future plans of those schools where ICT tools were not being used. The maximum number of schools stated that they shall offer computer courses or computer-aided courses based on the National Policy and as provided for in the prescribed curriculum.

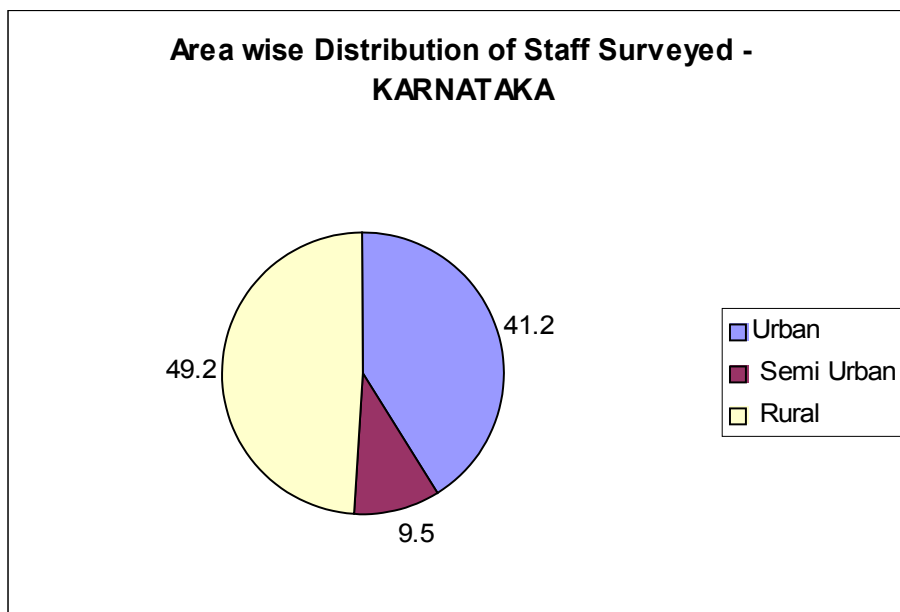
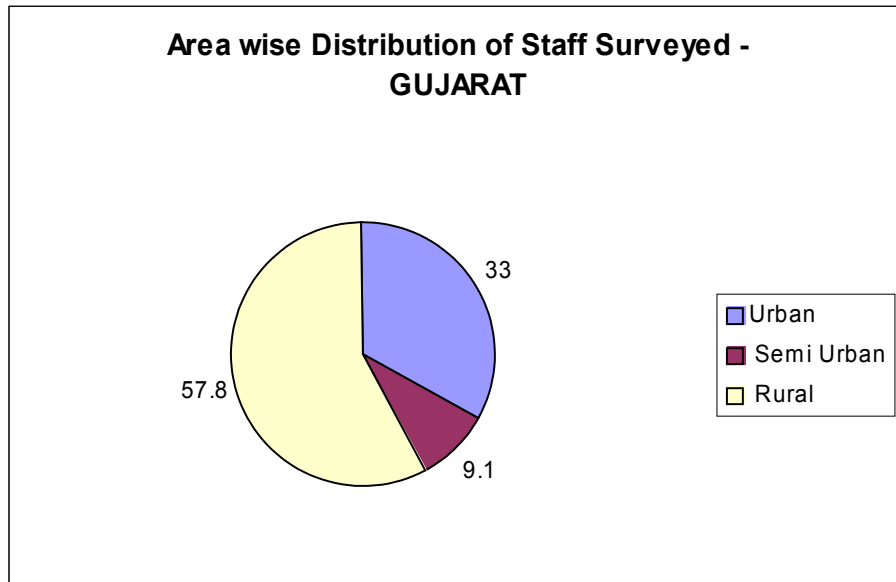
**Table : H 41.1**  
**Means of offering Computer Courses by Schools**

	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Based on the National ICT Policy	14.0	2.5	48.0	23.0	9.0	3.0	40.0	19.0
As Provided for in the Prescribed Curriculum	22.0	23.0	3.5	15.0	19.0	12.5	27.0	19.6
As an Elective	0.0	6.0	1.0	2.8	6.0	2.5	3.5	3.6
As a Special Programme	1.0	1.0	0.0	0.6	2.0	2.0	0.0	1.2

## II. TEACHERS

A total of 6,570 staff members were covered under the survey out of which 3,292 were from Gujarat and 3,278 from Karnataka. The details are at 'Annexure VIII'. 57.8% of these from Gujarat were from rural areas while a little less than half (49.2%) were from the rural areas of Karnataka.

**Figure : T 6.1**



Staff in Government Schools were marginally more than Private ones in Gujarat. But, they comprised much more (63.8%) of the total in Karnataka. It was mentioned earlier that the number of schools run by the Government were 66.2% of the total schools covered in Karnataka. The number of government staff, therefore, closely approximate the number of government schools covered under the survey.

**Table : T 7.1  
Management of Schools & Teachers**

District/State	Government/Public		Private	
	N	%	N	%
Ahmedabad	258	30.8	581	69.2
Patan	806	59.0	560	41.0
Surendranagar	695	63.9	392	36.1
<b>Gujarat</b>	1759	53.4	1533	46.6
Bangalore	383	52.9	341	47.1
Bellary	774	58.5	550	41.5
Mandya	933	75.9	297	24.1
<b>Karnataka</b>	2090	63.8	1188	36.2

A majority of the staff in the schools surveyed were males. In Gujarat they comprised 63.5% of the total while in Karnataka males were 53.3%. Interestingly, in both Ahmedabad & Karnataka a majority of the staff was female!

**Table : T 8.1  
Gender Distribution of Staff Surveyed**

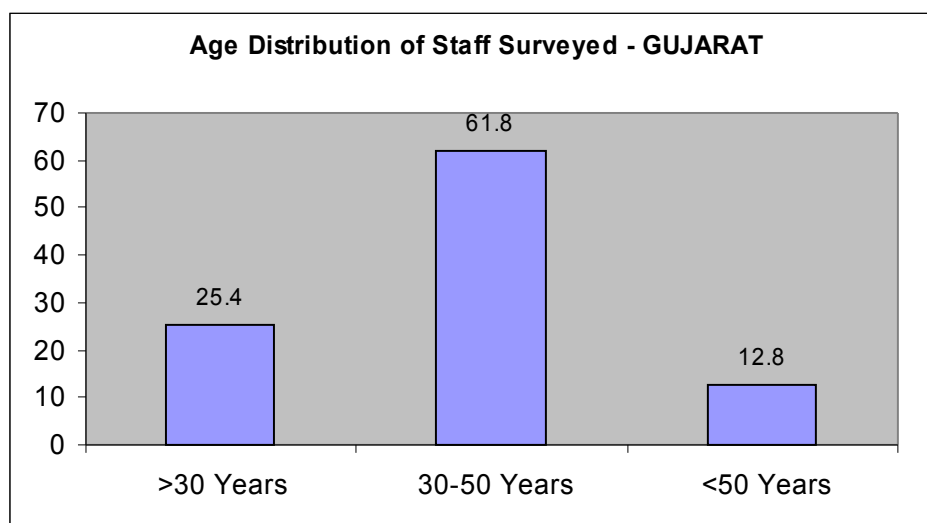
District/State	Male		Female	
	N	%	N	%
Ahmedabad	405	48.3	434	51.7
Patan	891	65.2	475	34.8
Surendranagar	794	73.0	293	27.0
<b>Gujarat</b>	2090	63.5	1202	36.5

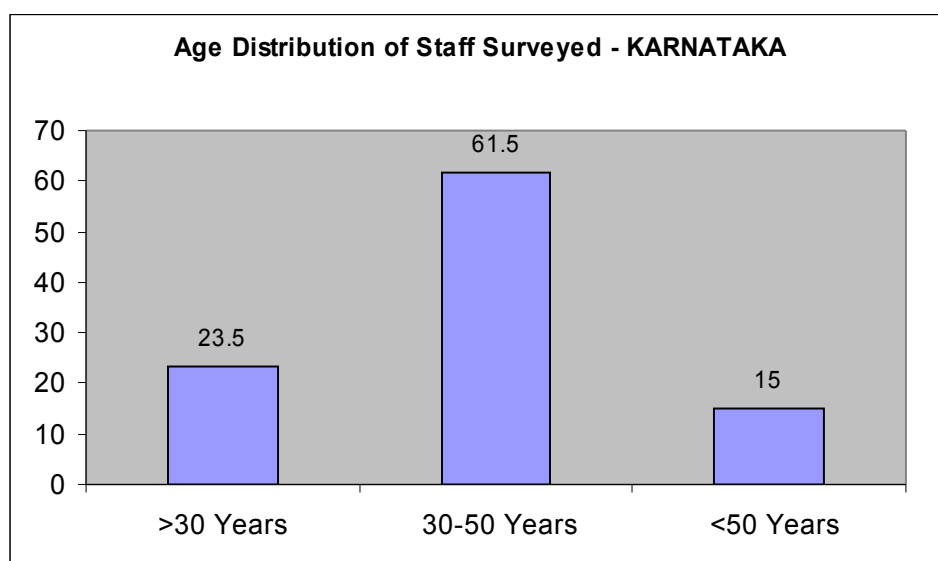
**Table : T : 8.1 (Continued)**  
**Gender Distribution of Staff Surveyed**

District/State	Male		Female	
	N	%	N	%
Bangalore	229	31.6	495	68.4
Bellary	825	62.3	499	37.7
Mandya	692	56.3	538	43.7
<b>Karnataka</b>	1746	53.3	1532	46.7

The maximum numbers of teachers in both the States – more than 60% - were in the age group of 30-50 years. The maximum numbers of young teachers i.e. under 30 years were in Surendranagar and the largest number of teachers in the over 50 years age bracket were in Bangalore (**Annexure IX**).

**Figure : T 9.1**





Irrespective of the location of the school, whether it was urban or rural the maximum number of teachers continued to be in the age group of 30-50 years. There was thus no correlation with the area.

**Table : T 9.2**  
**Area & Age Distribution of Teachers**

District/State	Under 30 Years		30 – 50 Years		Over 50 Years		Total	
	N	%	N	%	N	%	N	%
Urban	206	18.9	697	64.1	185	17.0	1088	100.0
Semi-urban	75	25.0	182	60.7	43	14.3	300	100.0
Rural	554	29.1	1155	60.7	195	10.2	1904	100.0
<b>Gujarat</b>	835	25.4	2034	61.8	423	12.8	3292	100.0
Urban	321	23.7	787	58.2	244	18.0	1352	100.0
Semi-urban	92	29.4	189	60.4	32	10.2	313	100.0
Rural	358	22.2	1039	64.4	216	13.4	1613	100.0
<b>Karnataka</b>	771	23.5	2015	61.5	492	15.0	3278	100.0

In Gujarat it is the Private Schools which have the largest number of teachers in the 30-50 age bracket while between the two, Government Schools had a larger number under the age of 30 years. In Karnataka, however, the situation is reverse. Many more Government School teachers fall in the 30-50 age group than Private Schools. The Karnataka Private Schools have substantially more younger teachers than

Government ones. The reason could be a more recent expansion of private education in the State.

**Table : T 9.3**  
**Management of Schools & Age Distribution of Teachers**

School Management	Under 30 Years		30 – 50 Years		Over 50 Years		Total	
	N	%	N	%	N	%	N	%
Government or Public	504	28.7	1034	58.8	221	12.6	1759	100.0
Private	331	21.6	1000	65.2	202	13.2	1533	100.0
<b>Gujarat</b>	835	25.4	2034	61.8	423	12.8	3292	100.0
Government or Public	376	18.0	1401	67.0	313	15.0	2090	100.0
Private	395	33.2	614	51.7	179	15.1	1188	100.0
<b>Karnataka</b>	771	23.5	2015	61.5	492	15.0	3278	100.0

**Table : T 9.4**  
**Academic level & Age Distribution of Teachers**

School Level	Under 30 Years		30 – 50 Years		Over 50 Years		Total	
	N	%	N	%	N	%	N	%
Primary	554	32.6	948	55.9	195	11.5	1697	100.0
Secondary	281	17.6	1086	68.1	228	14.3	1595	100.0
<b>Gujarat</b>	835	25.4	2034	61.8	423	12.8	3292	100.0
Primary	391	26.7	924	63.1	149	10.2	1464	100.0
Secondary	380	20.9	1091	60.1	343	18.9	1814	100.0
<b>Karnataka</b>	771	23.5	2015	61.5	492	15.0	3278	100.0

Assessing the length of experience of the teaching staff in the two States it was found that a majority of school teachers in Gujarat have an experience of less than 5 years in the profession. The teachers in Karnataka seemed to be more experienced as 50.9% of them had experience ranging from 6-20 years.

**Table : T 10.1**  
**Experience of Teaching Staff**

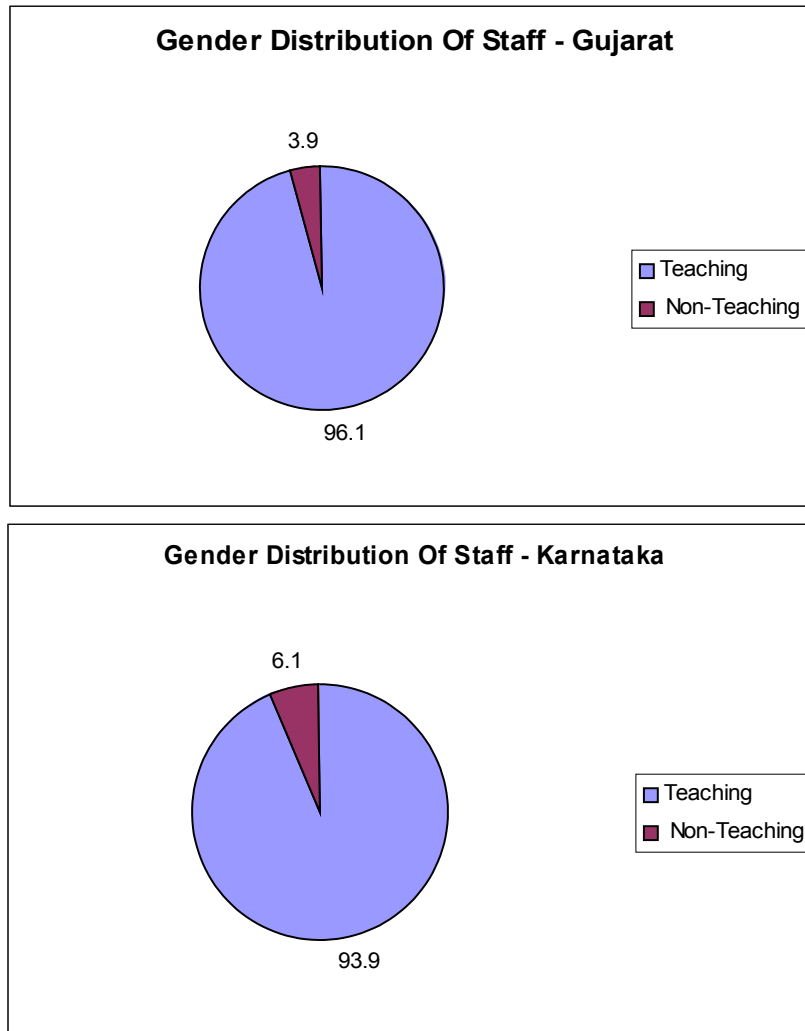
District/ State	Nil Experience		Up to 5 Years		6 – 20 Years		21 – 30 Years		More Than 30	
	N	%	N	%	N	%	N	%	N	%
Ahmedabad	12	1.4	737	87.8	89	10.6	1	0.1	0.0	0.0
Patan	25	1.8	1147	84.0	193	14.1	1	0.1	0.0	0.0
Surendranagar	45	4.1	930	85.6	112	10.3	0.0	0.0	0.0	0.0
<b>Gujarat</b>	82	2.5	2814	85.5	394	12.0	2	0.1	0.0	0.0
Bangalore	20	2.8	133	18.4	369	51.0	155	21.4	47	6.5
Bellary	78	5.9	381	28.8	666	50.3	153	11.6	46	3.5
Mandya	107	8.7	259	21.1	634	51.5	179	14.6	51	4.1
<b>Karnataka</b>	205	6.3	773	23.6	166	50.9	487	14.9	144	4.4

The basic activity which takes place in a school is teaching and the maximum number of human resource is utilized for the same purpose. This fact is reflected in the Table given below which shows that 92%-97% of the total staff in the schools was engaged in teaching.

**Table : T 12.1**  
**Gender Distribution Of Staff**

District/State	Teaching						Non-Teaching					
	Male		Female		Total		Male		Female		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Ahmedabad	379	45.2	418	49.8	797	95.0	26	3.1	16	1.9	42	5.0
Patan	854	62.5	455	33.3	1309	95.8	37	2.7	20	1.5	57	4.2
Surendranagar	773	71.1	283	26.0	1056	97.1	21	1.9	10	0.9	31	2.9
<b>Gujarat</b>	2006	60.9	1156	35.1	3162	96.1	84	2.6	46	1.4	130	3.9
Bangalore	216	29.8	478	66.0	694	95.9	13	1.8	17	2.3	30	4.1
Bellary	763	57.6	484	36.6	1247	94.2	62	4.7	15	1.1	77	5.8
Mandya	626	50.9	510	41.5	1136	92.4	66	5.4	28	2.3	94	7.6
<b>Karnataka</b>	1605	49.0	1472	44.9	3077	93.9	141	4.3	60	1.8	201	6.1

**Figure : T 12.1**



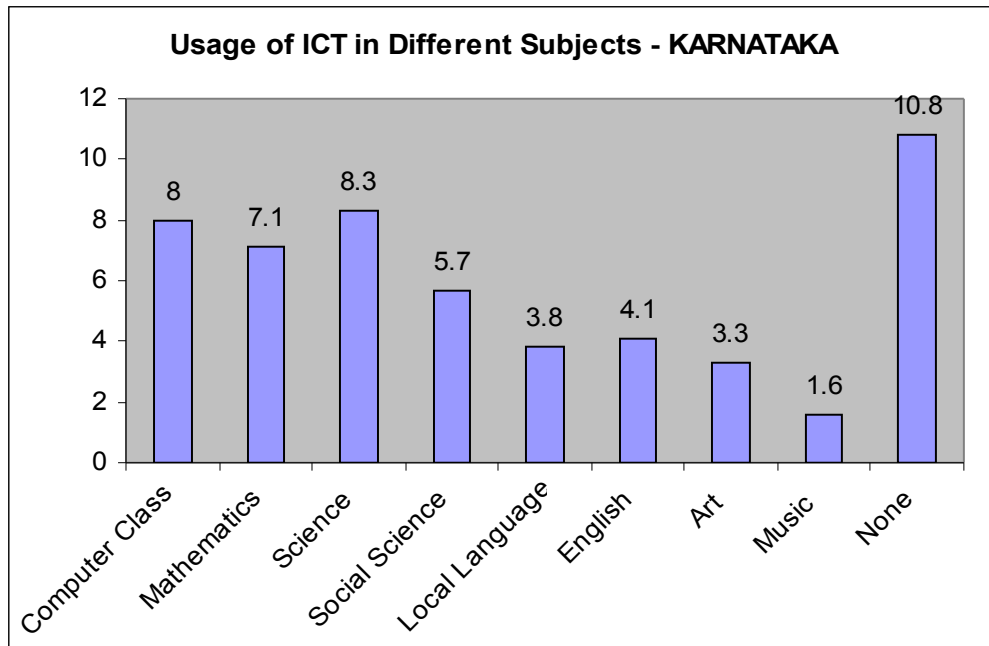
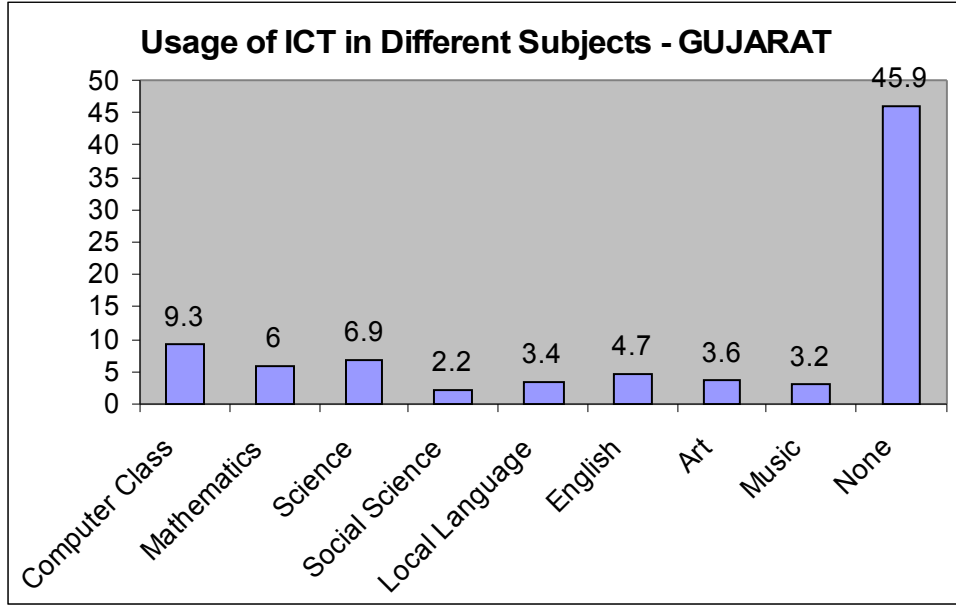
The total number of teaching staff who responded to the questionnaire were marginally more from the Primary Schools (51.5%) in Gujarat. However, in Karnataka, a majority of them (55.3%) taught in Secondary Schools.

**Table : T 14.1**  
**Distribution of Staff according to Academic level taught**

District/State	Primary		Secondary		Total	
	N	%	N	%	N	%
Ahmedabad	412	49.1	427	50.9	839	100.0
Patan	721	52.8	645	47.2	1366	100.0
Surendranagar	564	51.9	523	48.1	1087	100.0
<b>Gujarat</b>	1697	51.5	1595	48.5	3292	100.0
Bangalore	313	43.2	411	56.8	724	100.0
Bellary	617	46.6	707	53.4	1324	100.0
Mandya	534	43.4	696	56.6	1230	100.0
<b>Karnataka</b>	1464	44.7	1814	55.3	3278	100.0

The responding teachers were asked which subjects was ICT used for as a teaching tool. It was found that in a majority of cases ICT was not used in the teaching-learning process at all. In Gujarat this figure was 45.9%. In the State ICT was used most for computers and then for sciences. In Karnataka, the popularity ranking was reversed with it being most utilized in Science classes and then in the Computer class. There was little utilization of ICT tools in Social Science and Music in Gujarat and in Music and Art in Karnataka. Comparing the Districts it was found that the lowest usage was in Surendranagar in Gujarat and surprisingly Bangalore in Karnataka. The maximum utilization of ICT as a teaching tool in any subject in a District was in Ahmedabad for Computer classes. The details are at '**Annexure X**'.

**Figure : T 15.1**



The utilisation or otherwise of ICT in the teaching-learning process did exhibit rural urban differentials. The usage in the rural areas of Gujarat was much less than in the urban areas. Surprisingly, however in Karnataka it was the urban areas which showed lesser utilization than rural areas. Was it the impact of Mahithi Sindhu – the state’s initiative for providing ICT enabled education in government schools? The subjects where ICT was most utilized remained Computers, Mathematics and Science in both the urban and rural areas in Gujarat. In Karnataka while it were broadly the same subjects where ICT was most used in both the urban and rural areas, in rural Karnataka the third spot was occupied by Social Sciences.

**Table : T 15.2**  
**Area orientation of Teachers Using ICT in Different Subjects**

Subject	D. Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
	%	%	%	%	%	%
Computer Class	18.5	14.3	3.3	9.0	11.0	6.5
Mathematics	11.4	7.0	2.8	5.9	9.4	7.7
Science	12.2	9.4	3.5	7.7	7.4	9.0
Social Science	3.0	7.0	1.1	4.3	4.0	7.1
Local Language	4.8	7.3	2.0	3.2	3.3	4.3
English	9.5	4.5	2.1	4.0	2.7	4.5
Art	9.2	3.1	0.5	1.7	3.0	4.7
Music	7.4	6.3	0.4	0.8	3.3	2.0
None	37.7	49.0	50.0	14.3	9.7	8.1

In Gujarat, the most popular subject remained Computers in this respect in both Government and Private Schools. However, while Mathematics was the second most important in Government Schools, it was Sciences which were the next most popular subject in Private Schools for usage of ICT. In Karnataka Government Schools, Sciences was the most important subject where ICT was used. In Private Schools it was Computer classes and the next most popular in both Government and Private Schools was Mathematics.



**Table : T 15.3**  
**Usage of ICT by Teachers for different subjects according to Management of Schools**

Subject	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
	%	%	%	%
Computer Class	3.8	15.7	6.7	10.2
Mathematics	3.0	9.5	7.6	6.2
Science	2.8	11.6	9.8	5.6
Social Science	0.9	3.8	6.1	4.8
Local Language	1.8	5.3	4.1	3.3
English	1.6	8.3	3.7	4.8
Art	2.1	5.3	3.9	2.4
Music	0.9	5.8	1.9	1.2
Others	49.0	42.2	9.5	13.1

Assessing the utilization of ICT as a teaching tool in different subjects between Primary and Secondary Schools, while the relative ranking of the 3 subjects of Mathematics, Science and Computers differed between States, the fact remained that ICT tool were not being utilised for Languages and Social Sciences apart from Art and Music.

**Table : T 15.4**  
**Usage of ICT for different Subjects according to Academic Level taught**

Subject	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
	%	%	%	%
Computer Class	2.8	16.2	6.3	9.3
Mathematics	3.3	8.9	2.8	10.7
Science	2.9	11.2	2.4	13.1
Social Science	0.5	4.1	2.1	8.6
Local Language	1.6	5.4	1.1	6.0
English	2.6	7.0	2.0	5.8
Art	3.3	3.9	1.6	4.7
Music	2.8	3.6	0.9	2.2
None	44.3	47.6	8.7	12.6

An examination of the gender distribution of teachers using computers found that both male and female teachers of Gujarat had been using the computers more

than their counter-parts in Karnataka. However, male teachers in both the States has started using Computers within the last 2 years. This was true for females also. Thus, for both genders it was a recent phenomenon and there were no appreciable gender differences.

**Table : T 16.1  
Usage of Computers in Years according to Gender**

Gender	Years of Computer Use	Gujarat				Karnataka			
		Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
		%	%	%	%	%	%	%	%
Male	Less than 1 Year	12.7	13.7	9.1	11.9	3.6	5.9	4.8	4.9
	1 – 2 Years	9.5	24.1	3.2	13.4	5.5	6.7	4.0	5.4
	2 – 4 Years	5.4	2.0	1.5	2.7	1.6	4.0	1.4	2.5
	4 – 6 Years	3.5	0.9	0.5	1.4	1.4	0.7	0.4	0.7
	Not Responded	16.4	24.6	58.9	34.0	19.0	43.9	44.6	38.5
	<b>Total</b>	<b>47.6</b>	<b>65.2</b>	<b>73.2</b>	<b>63.4</b>	<b>31.1</b>	<b>61.2</b>	<b>55.1</b>	<b>52.2</b>
Female	Less than 1 Year	12.8	2.5	1.8	4.9	7.5	4.5	2.9	4.6
	1 – 2 Years	7.4	14.9	0.6	8.2	11.1	3.3	1.9	4.5
	2 – 4 Years	5.6	0.7	0.2	1.8	5.8	1.5	1.7	2.5
	4 – 6 Years	1.6	0.6	0.1	0.7	2.0	0.2	0.0	0.6
	Not Responded	25.0	16.0	24.1	21.0	42.5	29.3	38.4	35.6
	<b>Total</b>	<b>52.4</b>	<b>34.8</b>	<b>26.8</b>	<b>36.6</b>	<b>68.9</b>	<b>38.8</b>	<b>44.9</b>	<b>47.8</b>

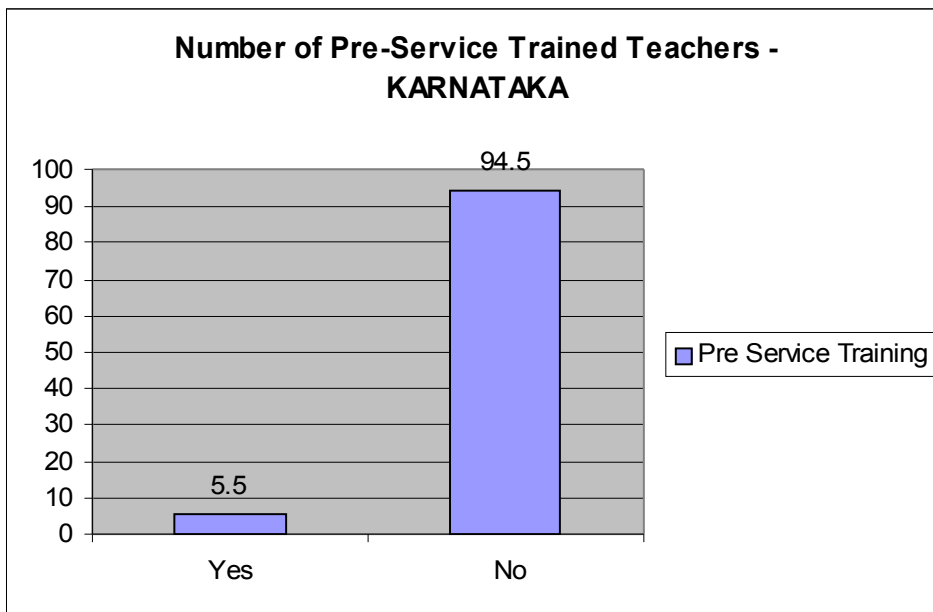
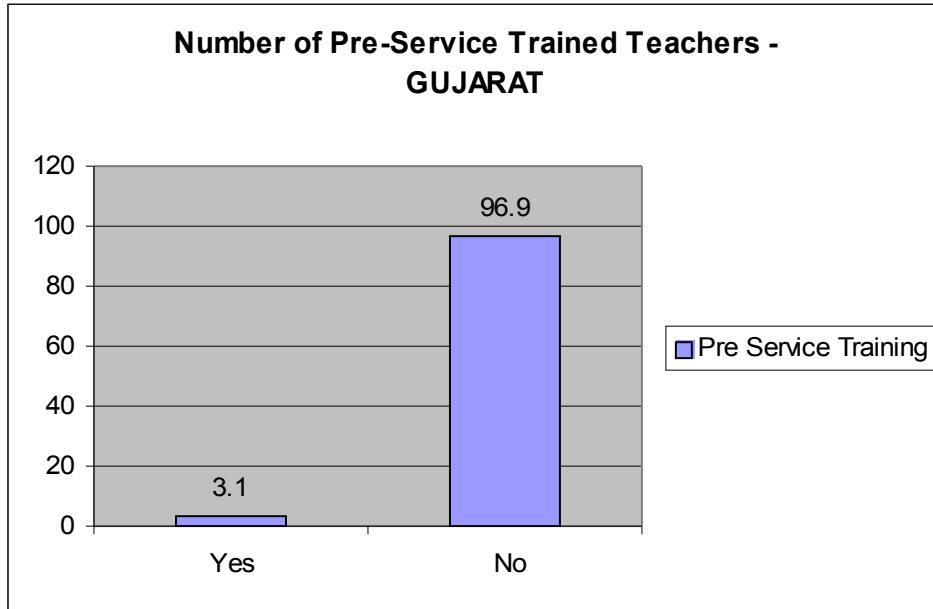
Correlating the number of years for which teachers have been using computers with their experience in years of teaching it was found that there was no significant correlation. The same trend of initiation of using computers within the last 2 years was discernible. What did come as a surprise was that no teacher with more than 20 years of experience in Gujarat claimed to be using computers. The explanation could lie in either the Government deciding as a policy not to train older teachers or the reluctance of more experienced teachers themselves to learn and use computers. There was no such factor noticeable in Karnataka.

**Table : T 16.2  
Experience of Teachers & Years of Computer Use**

State	Years of Computer Use	Experience in Years					
		Nil	Up to 5 Years	6 – 20 Years	21 – 30 Years	More than 30 Years	Total
		%	%	%	%	%	%
Gujarat	Less than 1 Year	12.0	17.2	14.7	0.0	0.0	16.8
	1 – 2 Years	21.3	21.4	23.7	0.0	0.0	21.7
	2 – 4 Years	5.3	4.8	1.9	0.0	0.0	4.5
	4 – 6 Years	1.3	2.4	0.5	0.0	0.0	2.1
	Not Responded	60.0	54.2	59.2	100.0	0.0	55.0
	<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>0.0</b>	<b>100.0</b>
Karnataka	Less than 1 Year	14.0	13.5	8.8	3.9	10.2	9.5
	1 – 2 Years	2.3	10.9	9.8	10.2	16.1	10.0
	2 – 4 Years	2.9	7.7	4.9	2.8	2.2	5.0
	4 – 6 Years	0.6	3.3	0.8	0.4	0.0	1.3
	Not Responded	80.1	64.5	75.7	82.7	71.5	74.2
	<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

An assessment of the source of training received by the teachers found that there was very low percentage of pre-service training, which ranged from 3.1% in Gujarat to 5.5% in Karnataka. Many more teachers claimed to have been trained while in service during the last 3 years but the overall percentage still remained low – less than 12%. Many more teachers in urban areas seem to have been provided with pre-service training and then in-service training also, compared to their rural counter-parts.

**Figure : T 17.1**



As would be seen from the Table below it were the female teachers who were more proficient at ICT at the time of joining the profession. In Karnataka, 6.8% of the female teachers were trained prior to joining service compared to 4.1% of the male teachers.

**Table : T 17.2**  
**Gender Distribution of Pre Service Trained Teachers**

District/State	Male		Female	
	Yes	No	Yes	No
Ahmedabad	8.2	91.8	6.5	93.5
Patan	1.4	98.6	1.5	98.5
Surendranagar	2.0	98.0	2.1	97.9
<b>Gujarat</b>	<b>2.9</b>	<b>97.1</b>	<b>3.4</b>	<b>96.6</b>
Bangalore	7.9	92.1	9.7	90.3
Bellary	4.9	95.1	6.8	93.2
Mandya	1.9	98.1	4.1	95.9
<b>Karnataka</b>	<b>4.1</b>	<b>95.9</b>	<b>6.8</b>	<b>93.2</b>

As would be expected more secondary school teachers had acquired training at ICT tools compared to their primary school counterparts.

**Table : T 17.3**  
**Number of Teachers with Pre-Service Training as per Academic Level**

District/State	Primary		Secondary	
	Yes	No	Yes	No
Ahmedabad	4.6	95.4	9.8	90.2
Patan	0.1	99.9	2.8	97.2
Surendranagar	0.0	100.0	4.2	95.8
<b>Gujarat</b>	<b>1.2</b>	<b>98.8</b>	<b>5.1</b>	<b>94.9</b>
Bangalore	5.1	94.9	12.2	87.8
Bellary	5.5	94.5	5.7	94.3
Mandya	3.0	97.0	2.7	97.3
<b>Karnataka</b>	<b>4.5</b>	<b>95.5</b>	<b>6.0</b>	<b>94.0</b>

In both Gujarat and Karnataka many more of the teachers engaged by private schools were trained at ICT tools than those recruited by government. In Karnataka, for example, the figure was three times as much.

**Table : T 17.4**  
**Number of Teachers with Pre-Service Training determined by Management of Schools**

District/State	Government/Public		Private	
	Yes	No	Yes	No
Ahmedabad	1.2	98.8	10.0	90.0
Patan	0.5	99.5	2.7	97.3
Surendranagar	0.9	99.1	4.1	95.9
<b>Gujarat</b>	<b>0.7</b>	<b>99.3</b>	<b>5.8</b>	<b>94.2</b>
Bangalore	4.4	95.6	14.4	85.6
Bellary	3.2	96.8	8.9	91.1
Mandya	2.1	97.9	5.1	94.9
<b>Karnataka</b>	<b>3.0</b>	<b>97.0</b>	<b>9.5</b>	<b>90.5</b>

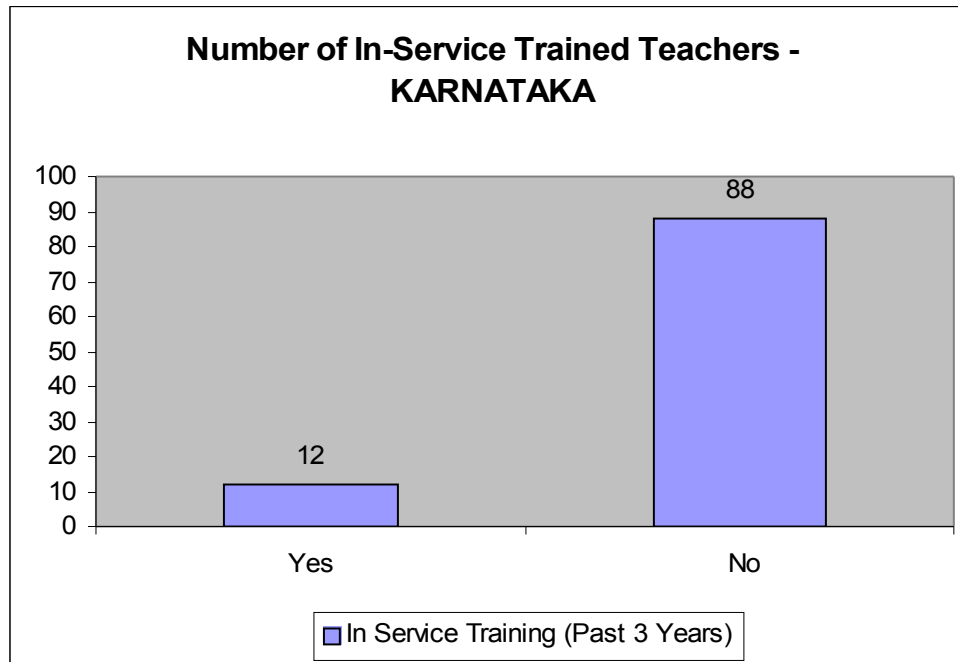
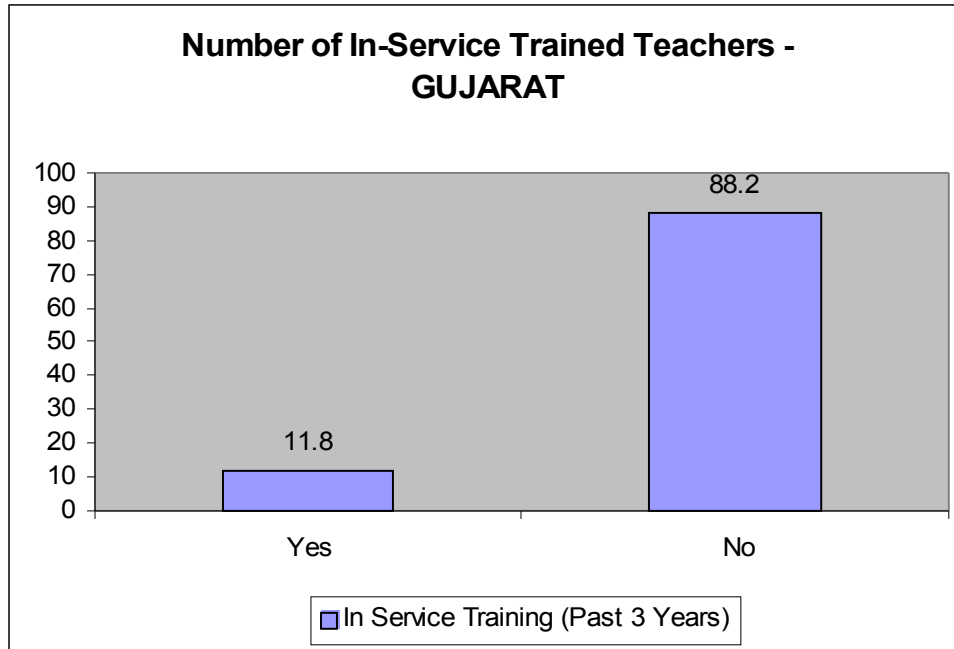
Not surprisingly it were the urban based teachers who had proficiency at ICT and related technologies at the time of joining service. This was possibly due to the fact that such facilities were more accessible in the towns.

**Table : T 17.5**  
**Number of Pre-Service Trained Teachers according to Area**

District/State	Urban		Semi Urban		Rural	
	Yes	No	Yes	No	Yes	No
Ahmedabad	7.4	92.6	0.0	100.0	4.8	95.2
Patan	2.3	97.7	4.8	95.2	1.0	99.0
Surendranagar	0.0	100.0	6.5	93.5	0.8	99.2
<b>Gujarat</b>	<b>6.1</b>	<b>93.9</b>	<b>6.0</b>	<b>94.0</b>	<b>1.0</b>	<b>99.0</b>
Bangalore	7.4	92.6	24.1	75.9	5.3	94.7
Bellary	5.4	94.6	8.1	91.9	5.4	94.6
Mandya	4.9	95.1	2.8	97.2	2.1	97.9
<b>Karnataka</b>	<b>6.1</b>	<b>93.9</b>	<b>9.9</b>	<b>90.1</b>	<b>3.8</b>	<b>96.2</b>

As has been mentioned earlier the number of teachers which received ICT training while in service remained extremely low. While the figure was 11.8% for Gujarat, it was 12% for Karnataka. The maximum number of trained teachers was in Ahmedabad at 40.3% (**Annexure XII**).

**Figure : T 18.1**



Many more female teachers acquired ICT training in Gujarat compared to their male counterparts. However, in Karnataka it were the males who were more enthusiastic.

**Table : T 18.2**  
**Gender Distribution of In-Service Trained Teachers**

District/State	Male		Female	
	Yes	No	Yes	No
Ahmedabad	28.6	71.4	49.8	50.2
Patan	1.7	98.3	0.8	99.2
Surendranagar	3.6	96.4	3.4	96.6
<b>Gujarat</b>	<b>7.7</b>	<b>92.3</b>	<b>19.1</b>	<b>80.9</b>
Bangalore	13.1	86.9	12.7	87.3
Bellary	15.4	84.6	8.0	92.0
Mandya	12.0	88.0	7.3	92.7
<b>Karnataka</b>	<b>13.8</b>	<b>86.2</b>	<b>9.3</b>	<b>90.7</b>

Gujarat seemed to have focused on primary school teachers for providing in-service ICT training while Karnataka gave importance to secondary school teachers. 18.3% of Karnataka secondary school teachers had ICT training compared to 3.5% of primary school teachers.

**Table : T 18.3**  
**Number of In-Service Trained Teachers according to Academic Level**

District/State	Primary		Secondary	
	Yes	No	Yes	No
Ahmedabad	60.9	39.1	19.0	81.0
Patan	0.1	99.9	2.8	97.2
Surendranagar	0.5	99.5	6.9	93.1
<b>Gujarat</b>	<b>15.0</b>	<b>85.0</b>	<b>8.5</b>	<b>91.5</b>
Bangalore	2.6	97.4	20.7	79.3
Bellary	3.9	96.1	20.2	79.8
Mandya	3.6	96.4	14.8	85.2
<b>Karnataka</b>	<b>3.5</b>	<b>96.5</b>	<b>18.3</b>	<b>81.7</b>

While more teachers recruited by private schools had proficiency at ICT tools before joining service, more government school teachers underwent training while in service. This figure was three times that of private school teachers trained in Karnataka.

**Table : T 18.4**  
**Number of In-Service Trained Teachers according to Management of Schools**

District/State	Government/Public		Private	
	Yes	No	Yes	No
Ahmedabad	82.2	17.8	20.7	79.3
Patan	0.4	99.6	2.9	97.1
Surendranagar	2.0	98.0	6.4	93.6
<b>Gujarat</b>	<b>13.0</b>	<b>87.0</b>	<b>10.5</b>	<b>89.5</b>
Bangalore	17.2	82.8	7.9	92.1
Bellary	19.1	80.9	3.5	96.5
Mandya	12.3	87.7	2.4	97.6
<b>Karnataka</b>	<b>15.7</b>	<b>84.3</b>	<b>4.5</b>	<b>95.5</b>

While more urban based teachers received training while in-service in Gujarat, it were the teachers of rural schools which were the focus in Karnataka. Moreover, the sharp differential between school teachers belonging to urban and rural areas of Gujarat were not in evidence in Karnataka.

**Table : T 18.5**  
**Number of In-Service Trained Teachers according to Area**

District/State	Urban		Semi Urban		Rural	
	Yes	No	Yes	No	Yes	No
Ahmedabad	40.3	59.7	0.0	100.0	23.8	76.2
Patan	3.0	97.0	6.4	93.6	0.7	99.3
Surendranagar	0.0	100.0	10.8	89.2	1.7	98.3
<b>Gujarat</b>	<b>30.8</b>	<b>69.2</b>	<b>9.7</b>	<b>90.3</b>	<b>1.4</b>	<b>98.6</b>
Bangalore	13.0	87.0	15.7	84.3	7.0	93.0
Bellary	8.3	91.7	14.9	85.1	14.9	85.1
Mandya	4.6	95.4	17.5	82.5	10.7	89.3
<b>Karnataka</b>	<b>9.5</b>	<b>90.5</b>	<b>16.3</b>	<b>83.7</b>	<b>12.6</b>	<b>87.4</b>

An interesting question posed to the teachers concerned their motivation for attending computer training. In both Gujarat and Karnataka, the teachers stated that their main reason for attending such training was the realization that training was required. The second most important motivator in both the States was career enhancement. Financial reasons or those connected with prestige were low in the list of motivators.

**Table : T 19.1**  
**Reason for attending Computer Training**

Reason	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Financial	1.5	0.4	0.9	0.9	1.2	0.8	0.2	0.6
Prestige	1.6	0.8	0.0	0.8	0.1	1.2	0.4	0.6
Career Enhancement	18.6	11.7	8.1	12.2	19.3	12.3	8.5	12.5
Personal Growth	24.0	8.6	6.7	11.9	16.0	12.2	9.3	12.0
Training is Required	42.2	14.7	59.0	36.4	14.1	15.6	10.8	13.5

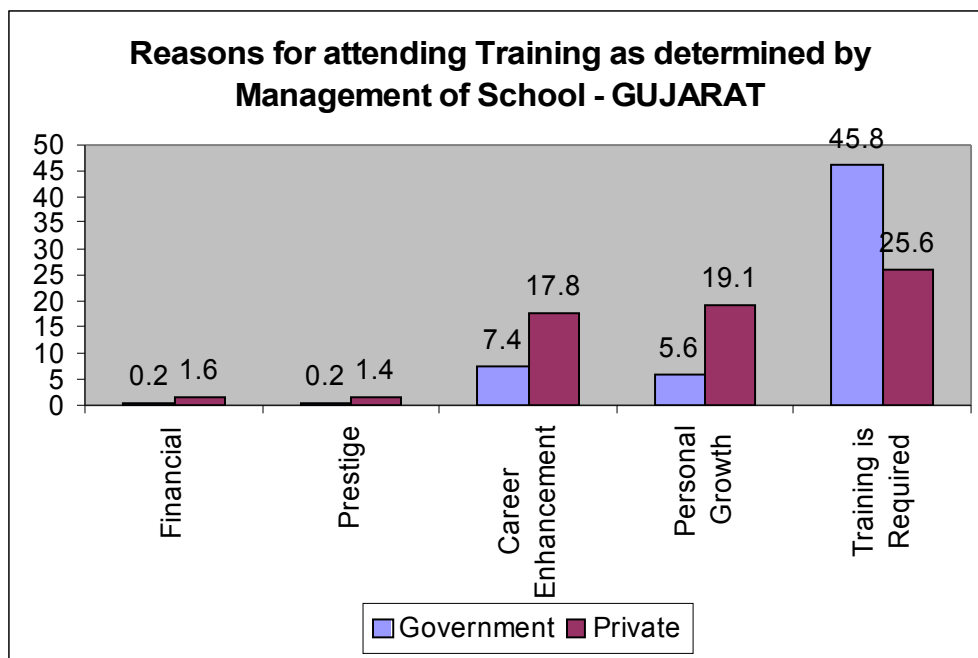
In both urban and rural areas of the two States the main motivators continued to be the same and therefore, did not show much correlation with the area the school was located in. In urban Gujarat however, personal growth emerge as an important reason for attending computer training.

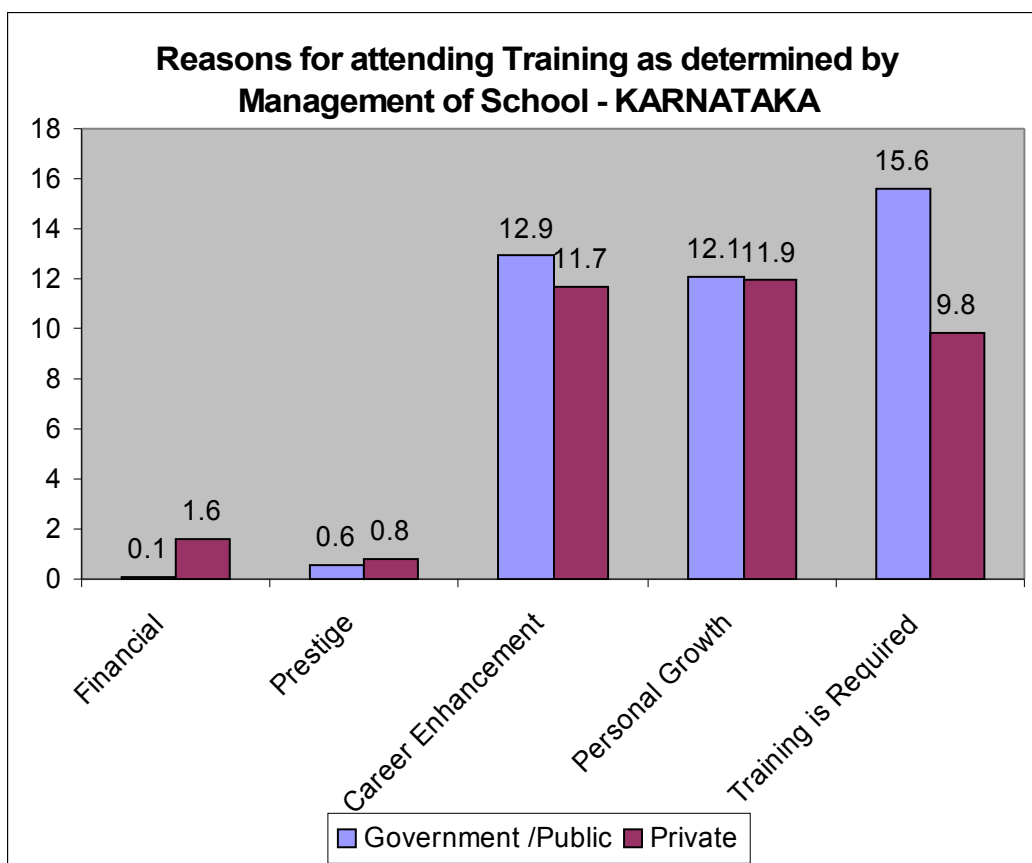
**Table : T 19.2**  
**Reasons for attending Training as determined by Area**

Reason	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Financial	1.3	3.1	0.3	0.7	1.3	0.5
Prestige	1.6	1.0	0.3	0.4	0.0	1.0
Career Enhancement	16.8	19.2	8.6	12.9	10.4	12.6
Personal Growth	22.7	20.3	4.5	12.5	11.0	11.7
Training is Required	34.9	27.3	38.7	12.6	17.7	13.4

A comparison of the reasons motivating Government School teachers and Private ones found that the most important reason for both the groups in Gujarat remained the realization that training is important. There was however a difference in the second most important reason. While for Government Schools it was career enhancement, for Private School teachers it was personal growth. In Karnataka, while the second most important reason for attending computer training was the same for both Private and Government School teachers – career enhancement – the most important motivator for Government School teachers was the realization that training is required while for Private School teachers it was personal growth. Interestingly, the two most important reasons why Government School teachers opted for training was the same in both the States. However, there was a difference in the motivators for Private School teachers in the two States.

**Figure : T 19.3**





The same broad trend was apparent when teachers were assessed according to Primary or Secondary Schools. The only exception was the reason for attending training by Primary Teachers in Gujarat where personal growth was the second most important motivator.

**Table : T 19.4**  
**Reasons for Attending Training as determined by Academic Level taught**

Reason	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Financial	0.5	1.2	0.7	0.6
Prestige	0.5	1.0	0.1	1.1
Career Enhancement	4.6	20.5	5.0	18.6
Personal Growth	5.7	18.5	4.5	18.2
Training is Required	40.2	32.3	6.3	19.3

An assessment was made of the level of expertise in the use of various software tools and applications. These ranged from simple ones like Word Processing, Power Point, Internet Browsing to Programme and Project Management. Teachers from Gujarat consistently reported better expertise at these applications than those from Karnataka. Interestingly, however teachers from both the States were best at Word Processing and then at presentation tools. In Gujarat they were least acquainted with Project Management and in Karnataka with web-page designing. In general the level of expertise was quite low. The expertise at even basic activities like e-mailing and Internet Browsing was fairly low primarily because of the lack of Internet access in schools. The major difference in the level of expertise remained between teachers from Ahmedabad and Surendranagar and those from Bangalore and Mandya. It was found that there was practically no expertise in higher order skills like web-page designing or data base management.

**Table : T 20.1**  
**Teachers & their level of expertise in Computer Applications**

Application	Level of Expertise	GUJARAT				KARNATAKA			
		Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Word Processing	Excellent	7.7	0.7	1.5	2.7	3.2	2.9	0.5	2.1
	Very Good	5.0	41.8	1.9	19.2	3.2	5.5	2.4	3.8
	Good	20.5	2.8	3.5	7.5	12.5	8.5	7.5	9.0
	Fair	20.2	3.7	1.1	7.0	4.6	4.5	2.6	3.8
	No Capability	46.7	51.1	92.0	63.6	76.5	78.6	87.1	81.2
Spread Sheet	Excellent	4.9	0.5	1.2	1.9	1.9	1.7	0.4	1.2
	Very Good	5.5	44.2	1.2	20.1	2.2	3.7	1.3	2.5
	Good	13.4	1.5	1.6	4.5	9.9	5.6	4.8	6.3
	Fair	14.3	2.0	0.7	4.6	4.0	2.6	2.4	2.9
	No Capability	61.9	51.9	95.3	68.9	82.0	86.4	91.2	87.2
Presentation Tools	Excellent	5.4	0.4	1.1	1.9	2.7	3.1	0.9	2.2
	Very Good	7.3	44.4	1.3	20.7	3.7	3.7	1.6	2.9
	Good	15.8	1.9	2.3	5.5	11.7	7.5	6.2	7.9
	Fair	18.3	1.8	0.9	5.7	4.6	2.4	2.1	2.8
	No Capability	53.2	51.6	94.3	66.3	77.2	83.3	89.3	84.1
E-mailing	Excellent	3.6	0.2	0.6	1.2	1.4	0.6	0.5	0.8
	Very Good	4.3	44.2	0.9	19.7	1.3	0.6	0.3	0.6
	Good	9.2	0.8	0.4	2.8	5.9	2.0	2.2	3.0
	Fair	16.7	1.0	0.4	4.7	3.3	2.9	1.8	2.6
	No Capability	66.2	53.7	97.8	71.6	88.0	93.8	95.2	93.0
Internet Browsing	Excellent	3.1	0.2	0.5	1.0	2.2	0.8	0.4	0.9
	Very Good	3.9	44.5	0.7	19.6	1.4	0.7	0.6	0.8
	Good	7.4	0.7	0.5	2.3	6.1	2.4	1.8	3.0
	Fair	14.8	0.9	0.4	4.2	2.6	3.8	1.5	2.7
	No Capability	70.8	53.7	98.0	72.8	87.8	92.2	95.8	92.5
Statistical Tools	Excellent	3.4	0.2	0.3	1.0	0.3	0.8	0.0	0.4
	Very Good	1.3	44.2	0.6	18.8	0.6	0.9	0.1	0.5
	Good	10.5	0.5	0.4	3.0	2.4	3.2	1.7	2.5
	Fair	10.2	1.9	0.6	3.5	2.9	2.7	1.3	2.2
	No Capability	74.7	53.2	98.2	73.7	93.8	92.4	96.9	94.4
Graphics	Excellent	2.4	0.2	0.4	0.8	0.9	1.0	0.2	0.7
	Very Good	1.8	44.6	0.3	19.0	0.4	0.9	0.7	0.7
	Good	9.4	1.4	1.0	3.3	3.3	2.3	2.9	2.8
	Fair	11.5	1.8	0.5	3.8	2.0	3.0	1.1	2.1
	No Capability	74.9	52.0	97.8	73.1	93.4	92.8	95.1	93.8

**Table : T 20.1 (Continued)**  
**Teachers & their level of expertise in Computer Applications**

Application	Level of Expertise	GUJARAT				KARNATAKA			
		Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
		%	%	%	%	%	%	%	%
WEB Page Designing	Excellent	1.3	0.1	0.2	0.4	0.6	0.5	0.1	0.4
	Very Good	1.5	44.2	0.3	18.8	0.4	1.4	0.2	0.7
	Good	3.6	0.7	0.6	1.4	1.6	1.3	0.4	1.0
	Fair	9.8	0.5	0.3	2.8	1.4	1.4	0.6	1.1
	No Capability	83.8	54.5	98.7	76.6	96.0	95.4	98.7	96.8
Programming	Excellent	2.0	0.2	0.3	0.7	1.0	1.3	0.3	0.8
	Very Good	2.0	43.8	0.8	18.9	0.7	2.3	0.6	1.3
	Good	6.5	1.3	0.2	2.2	5.0	3.4	2.7	3.5
	Fair	10.5	1.4	0.4	3.4	2.0	3.9	1.7	2.7
	No Capability	78.9	53.4	98.4	74.9	91.2	89.0	94.7	91.6
Data Base Management	Excellent	2.0	0.2	0.4	0.7	0.6	0.6	0.1	0.4
	Very Good	2.4	44.1	0.6	19.0	0.9	1.1	0.5	0.8
	Good	3.6	1.1	0.8	1.6	3.2	3.0	0.8	2.2
	Fair	8.9	1.4	0.3	2.9	2.9	1.2	1.2	1.6
	No Capability	83.1	53.2	98.0	75.7	92.5	94.1	97.4	94.9
Project Management	Excellent	1.9	0.2	0.3	0.6	0.6	0.6	0.0	0.4
	Very Good	1.3	44.0	0.2	18.6	0.6	1.4	0.2	0.8
	Good	2.3	0.2	0.8	0.9	3.9	1.4	0.9	1.8
	Fair	7.3	0.6	0.6	2.3	2.9	1.3	1.4	1.7
	No Capability	87.3	55.0	98.2	77.6	92.1	95.3	97.5	95.4

Teachers in urban areas exhibited better expertise than their rural counter-parts in Gujarat. This could however not be concluded with certainty for teachers in Karnataka. However, in both the States and in both urban and rural areas teachers were best at Word Processing skills.

**Table : T 20.2**  
**Teachers' level of expertise in Computer Applications as determined by Area**

Application	Level of Expertise	Gujarat			Karnataka		
		Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
		%	%	%	%	%	%
Word Processing	Excellent	6.3	3.8	0.5	1.3	3.3	2.5
	Very Good	8.6	9.1	26.7	2.6	3.7	4.9
	Good	16.4	9.4	2.2	9.6	12.4	7.9
	Fair	16.9	5.9	1.6	3.8	6.7	3.3
	No Capability	51.8	71.7	69.0	82.7	73.9	81.4
Spread Sheet	Excellent	4.0	4.9	0.2	0.9	3.0	1.2
	Very Good	9.3	6.3	28.3	1.6	1.7	3.4
	Good	11.3	3.5	0.9	7.2	5.4	5.7
	Fair	11.5	3.8	0.9	2.8	5.0	2.5
	No Capability	63.9	81.5	69.7	87.6	84.9	87.2
Presentation Tools	Excellent	4.4	3.1	0.3	1.4	5.0	2.3
	Very Good	10.9	8.0	28.1	2.3	1.0	3.8
	Good	12.5	7.0	1.4	8.0	9.4	7.6
	Fair	14.7	3.5	0.9	3.1	6.4	1.8
	No Capability	57.6	78.3	69.3	85.2	78.3	84.4
E-mailing	Excellent	2.7	2.1	0.2	1.0	1.7	0.4
	Very Good	8.8	6.3	27.8	0.6	1.0	0.6
	Good	7.5	0.7	0.5	3.6	5.7	1.9
	Fair	12.9	1.7	0.7	2.5	2.7	2.7
	No Capability	68.1	89.2	70.8	92.3	89.0	94.5
Internet Browsing	Excellent	2.4	1.4	0.2	1.0	2.7	0.5
	Very Good	8.4	5.9	28.0	0.9	0.3	0.9
	Good	6.0	1.7	0.3	3.5	5.7	2.0
	Fair	11.5	2.1	0.5	2.5	1.3	3.1
	No Capability	71.6	88.8	71.0	92.1	90.0	93.4
Statistical Tools	Excellent	2.7	1.0	0.1	0.2	1.3	0.3
	Very Good	6.2	5.2	27.9	0.5	0.3	0.6
	Good	8.3	1.4	0.3	2.2	2.0	2.8
	Fair	9.0	2.1	0.7	2.3	2.7	2.1
	No Capability	73.7	90.2	71.0	94.8	93.6	94.2
Graphics	Excellent	1.9	1.0	0.2	0.4	2.3	0.6
	Very Good	7.2	4.5	27.9	0.5	1.0	0.9
	Good	8.0	3.8	0.5	2.7	5.4	2.3
	Fair	9.7	1.0	0.9	2.1	2.0	2.1
	No Capability	73.2	89.5	70.5	94.3	89.3	94.2

**Table : T 20.2 (Continued)**  
**Teachers' level of expertise in Computer Applications as determined by Area**

Application	Level of Expertise	Gujarat			Karnataka		
		Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
		%	%	%	%	%	%
Web Page Designing	Excellent	1.1	0.3	0.1	0.2	1.3	0.3
	Very Good	6.5	4.5	27.9	0.6	0.3	0.9
	Good	3.1	1.7	0.4	1.4	0.3	0.9
	Fair	7.7	0.3	0.4	1.2	1.0	1.1
	No Capability	81.7	93.0	71.3	96.6	97.0	96.8
Programming	Excellent	1.7	1.0	0.0	0.5	1.3	1.0
	Very Good	6.9	5.9	27.6	0.9	2.0	1.6
	Good	5.9	0.3	0.5	4.0	5.4	2.8
	Fair	8.9	1.4	0.5	1.7	3.0	3.4
	No Capability	76.6	91.3	71.4	92.9	88.3	91.2
Data Base Management	Excellent	1.6	1.0	0.2	0.3	1.3	0.3
	Very Good	7.2	5.6	27.8	0.7	1.0	0.9
	Good	3.3	1.7	0.7	2.5	1.7	2.1
	Fair	7.7	1.0	0.5	2.2	1.3	1.1
	No Capability	80.3	90.6	70.8	94.3	94.6	95.5
Project Management	Excellent	1.6	1.0	0.0	0.5	1.0	0.1
	Very Good	6.3	4.5	27.7	0.5	1.3	0.9
	Good	2.0	1.4	0.2	2.3	1.7	1.3
	Fair	5.9	1.0	0.4	1.6	2.3	1.7
	No Capability	84.1	92.0	71.7	95.2	93.6	95.9

Correlating the level of skills of the teachers with the management of the schools one found no apparent relationship. In both Government and Private Schools in Karnataka and Gujarat, teachers were best at Word Processing and then at Presentation tools. Further analysis of the level of expertise was not attempted as the general level was too low and also subject to the assessment of the respondent himself.

**Table : T 20.3**  
**Teachers' level of Expertise in Computer Applications as determined by**  
**Management of School**

Application	Level of Expertise	Gujarat		Karnataka	
		Government or Public	Private	Government or Public	Private
		%	%	%	%
Word Processing	Excellent	0.4	5.4	2.2	1.9
	Very Good	24.7	12.9	4.3	3.0
	Good	6.1	9.0	9.6	8.0
	Fair	6.9	7.0	4.5	2.5
	No Capability	61.9	65.7	79.4	84.6
Spread Sheet	Excellent	0.4	3.6	1.2	1.3
	Very Good	25.4	13.9	2.8	1.8
	Good	4.2	4.9	7.1	4.8
	Fair	4.9	4.4	3.5	1.6
	No Capability	65.0	73.3	85.3	90.5
Presentation Tools	Excellent	0.5	3.6	2.4	1.9
	Very Good	26.0	14.4	3.5	1.8
	Good	5.2	5.9	8.6	6.7
	Fair	6.4	4.9	3.3	1.8
	No Capability	62.0	71.2	82.1	87.8
E-mailing	Excellent	0.3	2.3	0.4	1.4
	Very Good	25.6	12.8	0.7	0.6
	Good	3.0	2.5	2.9	3.1
	Fair	5.8	3.6	3.1	1.6
	No Capability	65.3	78.9	92.9	93.2
Internet Browsing	Excellent	0.4	1.8	0.7	1.4
	Very Good	25.7	12.5	0.9	0.8
	Good	2.4	2.3	3.1	2.8
	Fair	5.6	2.7	3.2	1.8
	No Capability	65.9	80.8	92.1	93.2
Statistical Tools	Excellent		2.2	0.4	0.4
	Very Good	25.4	11.1	0.6	0.4
	Good	3.1	2.9	3.3	1.0
	Fair	4.4	2.5	2.4	2.0
	No Capability	67.0	81.3	93.3	96.3
Graphics	Excellent	0.1	1.7	0.9	0.4
	Very Good	25.5	11.4	0.7	0.8
	Good	2.3	4.4	3.4	1.6
	Fair	4.5	2.9	2.6	1.2
	No Capability	67.6	79.5	92.5	96.0

**Table : T 20.3 (Continued)**  
**Teachers' level of Expertise in Computer Applications as determined by**  
**Management of School**

Application	Level of Expertise	GUJARAT		KARNATAKA	
		Government /Public	Private	Government /Public	Private
		%	%	%	%
WEB Page Designing	Excellent		0.9	0.2	0.6
	Very Good	25.4	11.1	0.7	0.7
	Good	1.2	1.6	1.1	0.9
	Fair	3.8	1.6	1.1	1.2
	No Capability	69.7	84.7	96.9	96.6
Programming	Excellent	0.1	1.4	1.0	0.6
	Very Good	25.4	11.3	1.3	1.4
	Good	2.5	1.9	3.9	3.0
	Fair	4.0	2.6	3.4	1.3
	No Capability	68.0	82.8	90.5	93.7
Data Base Management	Excellent	0.1	1.4	0.4	0.5
	Very Good	25.8	11.2	0.7	1.2
	Good	1.0	2.4	2.2	2.3
	Fair	2.4	3.6	1.6	1.6
	No Capability	70.8	81.4	95.2	94.5
Project Management	Excellent	0.0	1.4	0.3	0.5
	Very Good	25.3	10.9	1.0	0.5
	Good	0.9	1.0	2.1	1.1
	Fair	2.8	1.6	1.9	1.3
	No Capability	71.0	85.2	94.7	96.7

In Gujarat, in general, female teachers were found to have a higher level of expertise than their male counterparts. However, in Karnataka it were the men who were better. The activities or applications at which they were adept however did not change. Both the groups remained best at Word Processing.

**Table : T 20.4**  
**Gender Distribution of Teachers with their**  
**level of expertise in Computer Applications**

Application	Level of Expertise	Gujarat		Karnataka	
		Male	Female	Male	Female
		%	%	%	%
Word Processing	Excellent	3.0	2.2	2.6	1.5
	Very Good	19.4	18.9	4.4	3.2
	Good	6.8	8.7	9.2	8.9
	Fair	5.6	9.3	4.4	3.2
	No Capability	65.2	61.0	79.4	83.2
Spread Sheet	Excellent	2.3	1.0	1.6	0.8
	Very Good	20.1	20.0	3.0	1.9
	Good	3.6	6.1	6.2	6.3
	Fair	4.4	5.0	3.0	2.7
	No Capability	69.4	67.9	86.2	88.2
Presentation Tools	Excellent	2.2	1.4	2.9	1.5
	Very Good	21.3	19.5	3.7	2.1
	Good	4.2	7.9	7.2	8.7
	Fair	4.8	7.1	3.2	2.4
	No Capability	67.4	64.2	83.1	85.3
E-mailing	Excellent	1.4	0.9	0.8	0.7
	Very Good	19.5	19.9	0.9	0.3
	Good	2.1	3.9	2.7	3.2
	Fair	3.7	6.6	2.9	2.2
	No Capability	73.2	68.8	92.6	93.5
Internet Browsing	Excellent	1.3	0.6	1.1	0.8
	Very Good	19.6	19.6	1.2	0.4
	Good	2.0	2.9	3.1	2.9
	Fair	3.1	6.1	3.0	2.4
	No Capability	73.9	70.8	91.6	93.5
Statistical Tools	Excellent	1.2	0.7	0.7	0.0
	Very Good	19.0	18.4	0.8	0.2
	Good	2.3	4.2	3.3	1.6
	Fair	3.0	4.4	2.7	1.8
	No Capability	74.4	72.3	92.5	96.5
Graphics	Excellent	1.0	0.4	1.2	0.1
	Very Good	19.3	18.5	0.9	0.5
	Good	3.1	3.6	2.8	2.7
	Fair	3.5	4.2	2.5	1.6
	No Capability	73.0	73.2	92.6	95.0

**Table : T 20.4 (Continued)**  
**Gender Distribution of Teachers with their level of expertise in Computer Applications**

Application	Level of Expertise	Gujarat		Karnataka	
		Male	Female	Male	Female
		%	%	%	%
Web Page Designing	Excellent	0.5	0.3	0.4	0.3
	Very Good	19.0	18.3	1.0	0.4
	Good	1.2	1.7	1.2	0.8
	Fair	2.5	3.2	1.3	1.0
	No Capability	76.7	76.5	96.1	97.5
Programming	Excellent	0.6	0.7	1.2	0.4
	Very Good	19.3	18.2	1.4	1.3
	Good	1.3	3.9	2.7	4.5
	Fair	3.1	3.8	4.1	1.1
	No Capability	75.7	73.4	90.6	92.7
Data Base Management	Excellent	0.7	0.6	0.8	0.0
	Very Good	19.3	18.6	0.7	1.0
	Good	1.8	1.4	2.1	2.4
	Fair	2.9	2.9	1.9	1.3
	No Capability	75.2	76.6	94.5	95.4
Project Management	Excellent	0.7	0.4	0.4	0.3
	Very Good	18.6	18.5	1.2	0.3
	Good	0.9	0.9	1.9	1.6
	Fair	2.1	2.5	1.7	1.7
	No Capability	77.5	77.7	94.8	96.1

A surprising fact noticed when assessing the level of expertise of the teachers in the various aspects of ICT was that even teachers who were somewhat familiar with ICT, having used it for less than an year had no capability even in simple uses like Word Processing or E-mailing. In Gujarat 63.2% and in Karnataka 57.3% had been using computers for less than a year but had no capability in Word Processing. Again 68.7% of teachers in Gujarat and 67.2%

of the teachers in Karnataka who were somewhat familiar with computers had no capability in presentation tools. It thus seems that the quality of training imparted to the teachers were not of a satisfactory level. It was also found that the expertise in the use of computers for various purposes was positively correlated with the number of years that the teacher used computers. For example, only 11.3% of the teachers in Gujarat thought of themselves as excellent in using the Spread Sheets when they had 2 – 4 years of experience of using computers. This jumped to 35.8% in the 4 –6 years experience bracket. The relevant figures were 8.4% and 32.5% for the teachers in Karnataka. Similarly while 2.8% teachers in Gujarat found themselves excellent at Graphics within 4 years of experience of using computers, this figure rose to 17.9% after 2 more years.

**Table : T 20.6**

**Level of Expertise in Computer Applications of Teachers as determined by Experience of Using Computers**

Application	Level of Expertise	No. of Years Using Computers									
		GUJARAT					KARNATAKA				
		Less Than One Year	1 – 2 Years	2 – 4 Years	4 – 6 Years	Not Responded	Less Than One Year	1 – 2 Years	2 – 4 Years	4 – 6 Years	Not Responded
		%	%	%	%	%	%	%	%	%	%
Word Processing	Excellent	3.0	2.9	14.2	37.3	0.3	3.1	3.3	16.1	35.0	0.3
	Very Good	14.0	47.9	9.9	31.3	9.8	5.8	16.9	18.7	22.5	0.5
	Good	8.5	9.6	39.0	11.9	3.6	19.5	38.1	42.6	35.0	1.1
	Fair	11.3	8.2	17.0	3.0	4.5	14.3	14.7	6.5	0.0	0.9
	No Capability	63.2	31.4	19.9	16.4	81.8	57.3	27.0	16.1	7.5	97.3
Spread Sheet	Excellent	0.8	1.6	11.3	35.8	0.2	2.0	1.6	8.4	32.5	0.0
	Very Good	14.7	49.1	9.2	34.3	10.6	4.4	7.2	18.1	17.5	0.3
	Good	5.1	3.5	22.7	7.5	3.2	8.9	27.7	37.4	27.5	0.6
	Fair	7.7	5.0	15.6	3.0	2.8	6.8	16.3	8.4	0.0	0.2
	No Capability	71.7	40.9	41.1	19.4	83.2	77.8	47.2	27.7	22.5	98.9
Presentation Tools	Excellent	2.1	1.0	11.3	35.8	0.1	1.7	8.5	14.2	25.0	0.2
	Very Good	15.7	49.3	22.7	28.4	10.4	4.1	8.8	21.3	25.0	0.4
	Good	4.9	6.7	22.0	20.9	3.3	16.7	32.9	35.5	37.5	1.1
	Fair	8.7	6.7	16.3	0.0	3.7	10.2	12.4	6.5	5.0	0.3
	No Capability	68.7	36.2	27.7	14.9	82.5	67.2	37.5	22.6	7.5	98.1
E-mailing	Excellent	0.9	0.3	5.7	31.3	0.1	1.0	0.3	5.2	25.0	0.1
	Very Good	14.0	48.3	8.5	37.3	10.4	0.3	1.0	5.2	12.5	0.1
	Good	2.6	3.1	9.2	6.0	2.1	6.1	8.1	19.4	37.5	0.1
	Fair	6.6	4.5	19.9	6.0	3.0	3.1	10.4	17.4	10.0	0.4
	No Capability	75.8	43.8	56.7	19.4	84.5	89.4	80.1	52.9	15.0	99.3
Internet Browsing	Excellent	0.6	0.3	5.7	26.9	0.1	1.0	2.3	6.5	20.0	0.0
	Very Good	13.2	48.0	7.8	43.3	10.4	1.0	2.6	3.2	20.0	0.1
	Good	2.3	2.2	10.6	6.0	1.6	4.8	9.4	20.0	35.0	0.2
	Fair	4.9	3.9	19.1	4.5	2.9	3.1	14.3	13.5	7.5	0.3
	No Capability	79.1	45.5	56.7	19.4	85.0	90.1	71.3	56.8	17.5	99.4

**Table : T 20.6 (Continued)**

**Level of Expertise in Computer Applications of Teachers as determined by Experience of Using Computers**

Statistical Tools	Excellent	0.9	1.8	2.8	14.9	0.1	0.0	0.0	3.9	12.5	0.0
	Very Good	13.2	46.1	3.5	32.8	10.4	0.3	2.0	2.6	7.5	0.1
	Good	2.1	1.8	25.5	9.0	1.7	3.4	11.7	9.0	30.0	0.2
	Fair	6.0	1.9	14.2	7.5	2.4	5.5	8.1	14.2	5.0	0.2
	No Capability	77.7	48.5	53.9	35.8	85.4	90.8	78.2	70.3	45.0	99.5
Graphics	Excellent	1.1	0.3	2.8	17.9	0.1	1.0	1.6	3.2	20.0	0.0
	Very Good	13.8	47.2	6.4	23.9	10.4	2.4	2.3	2.6	7.5	0.0
	Good	3.0	3.6	22.0	17.9	1.2	8.9	9.8	10.3	12.5	0.4
	Fair	6.6	3.5	17.7	11.9	1.6	3.1	8.5	9.7	20.0	0.3
	No Capability	75.5	45.4	51.1	28.4	86.8	84.6	77.9	74.2	40.0	99.3
WEB Page Designing	Excellent	0.6	0.1	1.4	9.0	0.1	0.3	0.3	1.3	15.0	0.0
	Very Good	12.8	46.0	5.7	32.8	10.4	0.3	1.3	5.8	12.5	0.1
	Good	1.1	1.5	3.5	13.4	0.8	3.4	3.6	3.2	5.0	0.2
	Fair	5.3	1.5	14.9	3.0	1.6	1.4	2.0	11.6	5.0	0.2
	No Capability	80.2	50.9	74.5	41.8	87.2	94.5	92.8	78.1	62.5	99.4
Programming	Excellent	0.6	0.1	2.1	19.4	0.1	2.7	1.6	2.6	17.5	0.1
	Very Good	12.8	45.8	7.1	32.8	10.5	2.7	3.3	7.1	10.0	0.4
	Good	2.3	2.5	9.2	4.5	1.5	7.8	9.8	20.0	27.5	0.6
	Fair	6.2	1.8	11.3	6.0	2.4	7.5	12.1	5.8	7.5	0.5
	No Capability	78.1	49.8	70.2	37.3	85.6	79.2	73.3	64.5	37.5	98.5
Data Base Management	Excellent	0.8	0.3	2.8	16.4	0.1	0.3	0.0	2.6	17.5	0.0
	Very Good	12.3	46.7	9.9	35.8	10.3	1.0	3.3	4.5	12.5	0.0
	Good	1.1	2.3	10.6	10.4	0.5	5.5	3.6	16.1	22.5	0.3
	Fair	6.2	2.2	17.0	6.0	0.9	3.4	5.9	9.0	5.0	0.2
	No Capability	79.6	48.5	59.6	31.3	88.3	89.8	87.3	67.7	42.5	99.4

Project Management	Excellent	0.6	0.3	2.1	14.9	0.1	0.0	0.7	2.6	10.0	0.0
	Very Good	12.8	46.0	2.8	31.3	10.4	0.3	1.0	7.1	15.0	0.1
	Good	1.1	1.0	3.5	4.5	0.5	3.1	8.1	8.4	15.0	0.0
	Fair	4.7	0.9	6.4	14.9	1.3	4.8	5.9	10.3	7.5	0.0
	No Capability	80.8	51.8	85.1	34.3	87.8	91.8	84.4	71.6	52.5	99.7

One however could not find any direct correlation with the a level of expertise in the use of various ICT applications and the years of experience of teaching. However, the level of expertise of teachers who had some experience was better than those with no experience. This only points to the lack of an ICT component in the pre-service training programme of Institutions. Another indication was that the level of expertise did improve with experience but only in the initial years. Possibly the openness to new ideas and skills is greater in the younger age-groups.

**Table : T 20.7**  
**Level of Expertise in Computer Applications of Teachers as determined by Teaching Experience**

Application	Level of Expertise	Experience in Years							
		GUJARAT				KARNATAKA			
		Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years	Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years
		%	%	%	%	%	%	%	%
Word Processing	Excellent	2.7	2.9	1.1	50.0	1.8	4.6	1.6	0.4
	Very Good	17.3	18.6	24.0	0.0	2.3	6.2	3.8	1.1
	Good	8.0	7.8	4.8	0.0	5.3	11.2	9.0	6.9
	Fair	4.0	7.2	6.1	0.0	4.1	3.0	3.9	3.7
	No Capability	68.0	63.5	64.0	50.0	86.5	75.0	81.8	87.9
Spread Sheet	Excellent	5.3	2.0	0.0	50.0	0.6	3.2	0.8	0.2
	Very Good	16.0	19.7	23.7	0.0	0.6	3.5	2.9	0.9
	Good	0.0	4.8	3.7	0.0	4.7	7.5	6.3	3.9
	Fair	2.7	4.8	4.0	0.0	1.8	2.1	3.1	3.7
	No Capability	76.0	68.7	68.5	50.0	92.4	83.8	86.9	91.3
Presentation Tools	Excellent	1.3	2.2	0.0	0.0	1.2	5.0	1.3	1.1
	Very Good	18.7	20.3	24.0	0.0	3.5	3.6	3.2	1.1
	Good	5.3	5.9	2.9	0.0	3.5	9.7	8.4	5.4
	Fair	0.0	5.8	5.6	0.0	1.8	2.3	3.1	2.2
	No Capability	74.7	65.8	67.5	100.0	90.1	79.4	84.0	90.3

**Table : T 20.7 (Continued)**  
**Level of Expertise in Computer Applications of Teachers as determined by Teaching Experience**

Application	Level of Expertise	Experience in Years							
		GUJARAT				KARNATAKA			
		Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years	Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years
E-mailing	Excellent	1.3	1.3	0.5	0.0	0.6	3.2	0.0	0.0
	Very Good	14.7	19.3	23.2	0.0	1.2	1.5	0.3	0.4
	Good	1.3	3.0	1.3	0.0	2.3	4.4	3.1	0.0
	Fair	0.0	4.9	4.3	0.0	1.8	3.0	2.8	2.2
	No Capability	82.7	71.4	70.7	100.0	94.2	87.8	93.7	97.4
Internet Browsing	Excellent	1.3	1.2	0.0	0.0	0.6	2.8	0.4	0.4
	Very Good	14.7	19.2	23.5	0.0	1.8	1.8	0.4	0.2
	Good	1.3	2.5	0.8	50.0	2.3	4.1	3.2	0.6
	Fair	0.0	4.4	3.7	0.0	1.2	2.8	3.0	2.2
	No Capability	82.7	72.7	72.0	50.0	94.2	88.5	93.0	96.5
Statistical Tools	Excellent	1.3	1.1	0.0	0.0	0.0	0.8	0.4	0.0
	Very Good	14.7	18.3	23.5	0.0	0.0	1.0	0.4	0.6
	Good	1.3	3.2	1.6	50.0	2.9	2.8	2.5	1.1
	Fair	1.3	3.6	3.5	0.0	0.6	3.0	2.1	2.2
	No Capability	81.3	73.8	71.5	50.0	96.5	92.4	94.6	96.1
Graphics	Excellent	1.3	0.9	0.3	0.0	0.0	1.1	0.6	0.6
	Very Good	14.7	18.6	22.9	0.0	0.0	1.4	0.7	0.2
	Good	1.3	3.5	1.6	50.0	1.8	3.3	3.0	1.3
	Fair	0.0	4.0	3.2	0.0	1.8	2.2	2.4	1.5
	No Capability	82.7	73.0	72.0	50.0	96.5	92.0	93.3	96.3

**Table : T 20.7 (Continued)**

### Level of Expertise in Computer Applications of Teachers as determined by Teaching Experience

Application	Level of Expertise	Experience in Years							
		Gujarat				Karnataka			
		Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years	Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years
WEB Page Designing	Excellent	1.3	0.4	0.0	0.0	0.0	1.5	0.0	0.0
	Very Good	14.7	18.3	22.9	0.0	0.6	1.4	0.6	0.2
	Good	0.0	1.5	0.5	0.0	1.2	2.3	0.6	0.6
	Fair	0.0	3.0	2.1	0.0	1.8	1.4	1.1	1.1
	No Capability	84.0	76.7	74.4	100.0	96.5	93.4	97.7	98.1
Programming	Excellent	1.3	0.7	0.0	0.0	0.6	1.8	0.6	0.4
	Very Good	14.7	18.5	22.9	0.0	1.2	3.2	0.9	0.4
	Good	1.3	2.4	1.6	0.0	2.9	5.5	3.7	0.9
	Fair	0.0	3.5	2.9	0.0	1.2	1.8	3.2	2.6
	No Capability	82.7	74.9	72.5	100.0	94.2	87.7	91.7	95.7
Data Base Management	Excellent	1.3	0.8		0.0	0.0	1.2	0.3	0.0
	Very Good	14.7	18.6	23.2	0.0	0.6	2.5	0.4	0.2
	Good	1.3	1.8	0.8	0.0	1.8	4.3	2.0	0.6
	Fair	0.0	3.2	1.6	0.0	0.6	2.3	1.3	1.9
	No Capability	82.7	75.7	74.4	100.0	97.1	89.6	96.1	97.2

Project Management	Excellent	1.3	0.7	0.0	0.0	0.0	1.2	0.1	0.0
	Very Good	14.7	18.2	22.7	0.0	1.2	1.5	0.7	0.0
	Good	1.3	1.0	0.0	0.0	0.6	1.5	2.3	0.9
	Fair	0.0	2.4	1.9	0.0	1.2	1.8	2.0	0.9
	No Capability	82.7	77.7	75.5	100.0	97.1	93.9	94.9	98.3

During the survey the teachers were asked as to which were the purposes for which ICT tools were most often used. These could be finding information and educational material, making presentations, preparing lessons or reports. In both the States the teachers reported that they used ICT tools most for teaching-learning for specific subjects and then for teaching computer skills. ICT was least used in the two States by teachers for communicating with parents or with other teachers. Here again the reason could be the lack of access to Internet connectivity.

**Table : T 21.1**  
**Frequency of Using ICT tools by Teachers**

ICT Tools	Frequency	GUJARAT				KARNATAKA			
		Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
		%	%	%	%	%	%	%	%
Teaching - Learning for Specific Subjects	Very often	3.9	4.0	1.0	3.0	3.5	2.4	1.0	2.1
	Often	7.8	32.3	2.5	16.2	6.6	8.1	4.7	6.5
	Seldom	9.9	4.0	1.4	4.6	8.1	2.6	3.3	4.1
	Never	78.4	59.6	95.1	76.2	81.8	86.8	91.1	87.3
Teaching Computer Skills	Very often	3.3	2.1	1.4	2.2	3.2	1.6	1.3	1.9
	Often	4.9	38.2	1.1	17.4	3.9	3.6	3.2	3.5
	Seldom	5.8	4.0	2.3	3.9	2.9	3.0	1.3	2.3
	Never	86.1	55.7	95.2	76.5	90.1	91.8	94.2	92.3
Finding Information and Educational Material	Very often	2.8	1.8	1.3	1.9	0.9	1.4	0.3	0.8
	Often	5.8	38.4	0.5	17.5	5.3	4.2	2.5	3.8
	Seldom	7.4	3.3	1.1	3.6	4.8	1.7	2.1	2.5
	Never	84.1	56.5	97.1	77.0	89.0	92.8	95.2	92.8
Making Presentation/ Lectures	Very often	2.1	0.5	0.6	0.9	1.2	1.3	0.4	0.9
	Often	4.1	40.8	0.5	18.1	3.6	3.8	2.6	3.3
	Seldom	6.6	3.3	1.2	3.4	3.5	1.9	1.8	2.2
	Never	87.1	55.5	97.7	77.5	91.8	92.9	95.3	93.6
Preparing Lessons	Very often	2.8	0.5	0.6	1.1	1.7	2.1	1.1	1.7
	Often	4.9	40.3	0.7	18.2	4.6	3.8	2.8	3.6
	Seldom	4.8	2.7	1.2	2.7	4.5	2.6	1.4	2.6
	Never	87.6	56.5	97.5	78.0	89.2	91.5	94.6	92.1
Communicating with Students	Very often	2.1	0.7	0.5	1.0	2.4	2.5	1.3	2.0
	Often	2.1	40.3	0.8	17.5	2.7	2.6	2.5	2.6
	Seldom	4.3	1.5	1.0	2.1	2.6	1.8	1.7	1.9
	Never	91.5	57.5	97.7	79.5	92.2	93.1	94.5	93.4

**Table : T 21.1 (Continued)**  
**Frequency of Using ICT tools by Teachers**

ICT Tools	Frequency	GUJARAT				KARNATAKA			
		Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
		%	%	%	%	%	%	%	%
Communicating with other Teachers	Very often	1.3	0.5	0.5	0.7	0.7	2.0	0.7	1.2
	Often	1.9	40.3	0.5	17.3	2.0	2.1	1.9	2.0
	Seldom	3.3	1.4	0.9	1.7	3.0	2.4	0.8	1.9
	Never	93.6	57.8	98.2	80.3	94.2	93.5	96.6	94.8
Communicating with Parents	Very often	1.1	0.6	0.6	0.7	0.3	1.0	0.2	0.5
	Often	1.5	40.5	0.3	17.2	1.4	1.4	1.3	1.4
	Seldom	2.4	0.8	0.9	1.2	2.4	1.6	0.6	1.4
	Never	95.0	58.1	98.3	80.8	95.8	96.0	97.9	96.7
Monitoring and Evaluating Student's Progress	Very often	1.4	0.7	0.6	0.8	1.3	0.4	0.8	0.7
	Often	1.4	41.7	0.2	17.7	2.6	3.0	3.1	2.9
	Seldom	3.6	3.1	0.7	2.4	4.5	3.1	1.3	2.8
	Never	93.6	54.5	98.6	79.1	91.6	93.5	94.8	93.6
Preparing Reports	Very often	3.4	1.5	0.8	1.7	1.6	1.4	0.6	1.1
	Often	2.0	42.0	0.2	18.0	3.0	3.4	1.1	2.5
	Seldom	3.8	2.2	1.1	2.2	5.2	2.9	2.6	3.3
	Never	90.8	54.2	97.9	78.1	90.2	92.3	95.7	93.1
Further Personal Development	Very often	2.0	2.2	0.9	1.7	1.3	0.9	0.7	0.9
	Often	2.0	42.1	0.4	18.1	2.2	2.4	1.2	1.9
	Seldom	2.3	1.4	0.6	1.3	4.3	2.7	1.6	2.7
	Never	93.7	54.3	98.2	78.9	92.2	94.0	96.5	94.5

Examining the data from the urban-rural perspective we found that in the urban areas of both Gujarat and Karnataka, ICT was most used for teaching learning of specific subjects. The second most important use in urban Gujarat was finding information and educational material while in Karnataka it was teaching computer skills. The importance attached to different purposes varied in the case of rural areas. While in rural Gujarat, teachers used ICT equipment most for imparting computer skills and preparing reports, in Karnataka it was for teaching learning for specific subjects and then for preparing lessons. What was most interesting was that in both the urban and rural areas of the two States surveyed, ICT tools were least used for communicating with parents. This was perhaps a function of the low level of community participation in schools & also of the availability of the Internet.

**Table : T 21.2**  
**Frequency of Using ICT tools by Teachers as determined by Area**

ICT Tools	Frequency	Gujarat			Karnataka		
		Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
		%	%	%	%	%	%
Teaching - Learning for Specific Subjects	Very often	3.8	3.8	2.4	2.8	4.0	1.1
	Often	9.2	9.1	21.1	4.2	9.0	7.9
	Seldom	9.8	2.1	2.2	5.5	4.3	2.8
	Never	77.2	85.0	74.2	87.4	82.6	88.1
Teaching Computer Skills	Very often	2.8	5.9	1.2	2.7	5.0	0.5
	Often	7.5	5.6	24.8	2.5	5.0	4.1
	Seldom	5.9	3.8	2.7	2.0	1.7	2.7
	Never	83.8	84.6	71.2	92.8	88.3	92.7
Finding Information and Educational Material	Very often	2.3	5.2	1.1	0.6	0.7	1.1
	Often	9.7	5.2	23.8	3.2	6.0	3.9
	Seldom	6.6	2.1	2.2	2.8	3.7	2.1
	Never	81.4	87.4	72.9	93.4	89.6	93.0
Making Presentation/ Lectures	Very often	1.8	2.4	0.2	0.5	1.0	1.2
	Often	7.9	5.6	25.7	2.4	4.7	3.8
	Seldom	6.6	2.8	1.8	2.8	2.0	1.7
	Never	83.6	89.2	72.3	94.2	92.3	93.3
Preparing Lessons	Very often	2.2	2.8	0.2	1.8	1.3	1.6
	Often	8.4	5.6	25.5	2.7	5.4	4.0
	Seldom	4.7	3.8	1.5	2.6	2.7	2.6
	Never	84.7	87.8	72.8	92.9	90.6	91.8
Communicating with Students	Very often	2.2	2.4	0.1	1.6	1.7	2.5
	Often	6.3	5.9	25.5	2.1	3.7	2.8
	Seldom	4.0	2.1	1.0	1.5	1.0	2.5
	Never	87.5	89.5	73.5	94.8	93.6	92.3
Communicating with other Teachers	Very often	1.4	2.1	0.1	1.0	0.3	1.6
	Often	6.2	4.9	25.4	1.3	3.7	2.3
	Seldom	3.2	1.0	0.9	1.6	2.3	2.2
	Never	89.2	92.0	73.5	96.2	93.6	93.9
Communicating with Parents	Very often	1.3	2.4	0.2	0.1	1.0	0.8
	Often	6.0	4.9	25.4	0.9	3.0	1.5
	Seldom	2.1	1.4	0.7	1.6	2.3	1.1
	Never	90.6	91.3	73.7	97.4	93.6	96.6

**Table : T 21.2 (Continued)**  
**Frequency of Using ICT tools by Teachers as determined by Area**

ICT Tools	Frequency	Gujarat			Karnataka		
		Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
		%	%	%	%	%	%
Monitoring and Evaluating Student's Progress	Very often	1.5	2.8	0.2	0.6	1.0	0.8
	Often	6.9	4.5	25.8	2.3	4.0	3.2
	Seldom	3.6	1.4	2.0	2.0	5.7	2.8
	Never	88.1	91.3	72.1	95.0	89.3	93.2
Preparing Reports	Very often	3.3	3.5	0.6	0.9	2.3	1.1
	Often	7.0	4.5	26.2	1.8	3.3	2.9
	Seldom	3.8	2.8	1.3	2.9	3.7	3.5
	Never	85.9	89.2	71.9	94.4	90.6	92.5
Further Personal Development	Very often	2.6	3.5	0.9	0.9	1.0	0.9
	Often	6.8	5.2	26.4	1.2	3.0	2.3
	Seldom	2.4	1.0	0.8	2.6	3.0	2.7
	Never	88.2	90.2	72.0	95.4	93.0	94.1

Assessing the pattern of usage from the view point of Government or Private School teachers, one did not find any pattern. While teachers of Government Schools in Gujarat used ICT tools most for teaching computer skills and then making presentations/lectures or preparing reports, their Private School counter-parts used it most for teaching-learning of specific subjects and then for finding information and educational material. Government School teachers in Karnataka used these tools most for teaching-learning of specific subjects and then for preparing lessons. Private School teachers used it most for the same purpose as their Government counter-parts and then for teaching computer skills. However, the least usage remained the same across all categories – communicating with parents.

**Table : T 21.3**  
**Frequency of Using ICT tools as determined by Management of School**

ICT Tools	Frequency	GUJARAT		KARNATAKA	
		Government/ Public	Private	Government/ Public	Private
		%	%	%	%
Teaching - Learning for Specific Subjects	Very often	2.6	3.5	1.6	3.0
	Often	21.3	10.2	8.2	3.5
	Seldom	1.4	8.4	5.0	2.5
	Never	74.7	77.9	85.2	91.0
Teaching Computer Skills	Very often	1.1	3.4	1.0	3.3
	Often	24.5	9.2	4.4	2.0
	Seldom	2.3	5.7	3.2	0.7
	Never	72.0	81.7	91.4	93.9
Finding Information and Educational Material	Very often	1.2	2.6	0.7	1.2
	Often	23.4	10.7	4.4	2.7
	Seldom	2.2	5.3	3.4	1.0
	Never	73.2	81.5	91.5	95.1
Making Presentation/ Lectures	Very often	0.2	1.7	0.8	1.2
	Often	25.0	10.0	4.1	1.9
	Seldom	2.3	4.8	2.6	1.5
	Never	72.5	83.5	92.5	95.4
Preparing Lessons	Very often	0.2	2.1	1.5	2.0
	Often	25.0	10.2	4.5	2.0
	Seldom	1.9	3.7	3.4	1.1
	Never	72.9	84.0	90.6	94.9
Communicating with Students	Very often	0.1	2.0	2.1	2.0
	Often	24.5	9.2	3.0	1.8
	Seldom	1.5	2.7	2.5	0.8
	Never	73.8	86.1	92.3	95.4
Communicating with other Teachers	Very often	0.1	1.4	1.2	1.4
	Often	24.5	8.9	2.3	1.4
	Seldom	1.1	2.4	2.4	1.2
	Never	74.3	87.4	94.1	96.0
Communicating with Parents	Very often	0.1	1.5	0.8	0.0
	Often	24.5	8.8	1.5	1.3
	Seldom	0.9	1.6	1.7	1.0
	Never	74.6	88.0	96.0	97.7

**Table : T 21.3 (Continued)**  
**Frequency of Using ICT tools as determined by Management of School**

ICT Tools	Frequency	GUJARAT		KARNATAKA	
		Government / Public	Private	Government / Public	Private
		%	%	%	%
Monitoring and Evaluating Student's Progress	Very often	0.0	1.8	0.9	0.5
	Often	24.6	9.6	3.6	1.7
	Seldom	1.8	3.2	3.3	1.8
	Never	73.6	85.4	92.2	96.0
Preparing Reports	Very often	0.6	3.1	1.1	1.3
	Often	25.3	9.4	3.0	1.5
	Seldom	1.6	2.9	3.8	2.4
	Never	72.5	84.6	92.1	94.8
Further Personal Development	Very often	0.9	2.7	0.9	1.0
	Often	25.3	9.6	2.4	1.1
	Seldom	0.6	2.1	3.0	2.1
	Never	73.2	85.6	93.8	95.8

Teachers who were males used ICT tools most for teaching computer skills and then for teaching-learning of specific subjects. Their female counter-parts used these tools most for teaching-learning of specific subjects again, for finding information and educational material and then for preparing lessons. In Karnataka, both male and female teachers used ICT tools most for teaching-learning of specific subjects. The second most important purpose for male teachers in Karnataka was preparing lessons while for lady teachers it was teaching computer skills.

**Table : T 21.4**  
**Frequency of Using ICT Tools as determined by Gender**

ICT Tools	Frequency	Gujarat		Karnataka	
		Male	Female	Male	Female
		%	%	%	%
Teaching - Learning for Specific Subjects	Very often	3.5	2.1	1.9	2.3
	Often	15.3	17.7	7.8	5.1
	Seldom	5.1	3.9	4.2	3.9
	Never	76.1	76.3	86.0	88.7
Teaching Computer Skills	Very often	2.6	1.4	1.6	2.2
	Often	17.1	18.0	3.4	3.7
	Seldom	4.4	2.9	2.9	1.8
	Never	75.8	77.8	92.2	92.4
Finding Information and Educational Material	Very often	2.3	1.1	1.1	0.6
	Often	16.8	18.8	3.9	3.7
	Seldom	3.5	3.8	2.7	2.4
	Never	77.4	76.3	92.3	93.3
Making Presentation/ Lectures	Very often	1.0	0.8	1.3	0.5
	Often	18.0	18.2	3.6	3.1
	Seldom	3.5	3.4	2.4	2.0
	Never	77.5	77.7	92.8	94.4
Preparing Lessons	Very often	0.9	1.5	2.3	1.0
	Often	18.0	18.3	4.1	3.1
	Seldom	2.8	2.6	2.7	2.5
	Never	78.3	77.6	90.9	93.5
Communicating with Students	Very often	0.8	1.2	2.2	1.9
	Often	17.3	17.7	3.2	2.0
	Seldom	2.0	2.2	2.2	1.6
	Never	79.9	78.9	92.5	94.5
Communicating with other Teachers	Very often	0.7	0.7	1.4	1.0
	Often	17.0	17.7	2.5	1.5
	Seldom	1.8	1.4	2.3	1.6
	Never	80.4	80.2	93.8	95.9
Communicating with Parents	Very often	0.7	0.7	0.7	0.3
	Often	17.1	17.5	1.9	0.8
	Seldom	1.3	1.0	1.1	1.8
	Never	80.8	80.8	96.2	97.1

**Table : T 21.4 (Continued)**  
**Frequency of Using ICT Tools as determined by Gender**

ICT Tools	Frequency	Gujarat		Karnataka	
		Male	Female	Male	Female
		%	%	%	%
Monitoring and Evaluating Student's Progress	Very often	0.8	0.8	0.6	1.0
	Often	17.4	18.2	3.4	2.4
	Seldom	3.0	1.4	3.2	2.3
	Never	78.7	79.7	92.9	94.3
Preparing Reports	Very often	1.8	1.6	1.4	0.9
	Often	17.9	18.0	3.2	1.7
	Seldom	2.4	1.9	3.1	3.5
	Never	77.8	78.5	92.3	93.9
Further Personal Development	Very often	1.9	1.4	1.1	0.7
	Often	17.9	18.3	2.9	0.9
	Seldom	1.5	1.0	2.7	2.6
	Never	78.7	79.3	93.3	95.8

The Table given below shows that there was minimal use of ICT tools in Primary Schools of Karnataka. The maximum usage in the Secondary Schools of both the States was for teaching learning for specific subjects.

**Table : T 21.5**  
**Frequency of Using ICT tools by Teachers according to**  
**Academic Level Taught**

ICT Tools	Frequency	Gujarat		Karnataka	
		Primary	Secondary	Primary	Secondary
		%	%	%	%
Teaching - Learning for Specific Subjects	Very often	0.6	5.6	1.1	3.0
	Often	23.3	8.5	1.4	10.7
	Seldom	1.3	8.2	0.5	7.0
	Never	74.8	77.7	97.0	79.3
Teaching Computer Skills	Very often	0.3	4.2	1.7	2.0
	Often	26.2	8.0	1.3	5.3
	Seldom	0.7	7.3	0.2	4.1
	Never	72.8	80.5	96.8	88.6
Finding Information and Educational Material	Very often	0.5	3.3	0.0	1.5
	Often	26.6	7.8	1.4	5.8
	Seldom	1.3	6.1	0.3	4.4
	Never	71.6	82.8	98.3	88.3
Making Presentation/ Lectures	Very often	0.4	1.5	0.2	1.5
	Often	27.1	8.4	0.9	5.3
	Seldom	1.1	6.0	0.4	3.7
	Never	71.4	84.1	98.5	89.5
Preparing Lessons	Very often	0.5	1.8	0.6	2.5
	Often	27.4	8.2	0.8	5.9
	Seldom	0.7	4.9	0.1	4.6
	Never	71.4	85.2	98.4	87.0
Communicating with Students	Very often	0.4	1.6	0.7	3.1
	Often	26.6	7.6	0.8	4.1
	Seldom	0.8	3.4	0.1	3.4
	Never	72.2	87.4	98.4	89.3
Communicating with other Teachers	Very often	0.4	1.0	0.4	1.9
	Often	26.7	7.2	0.8	3.0
	Seldom	0.4	3.0	0.2	3.4
	Never	72.5	88.7	98.6	91.7

**Table : T 21.5 (Continued)**  
**Frequency of Using ICT tools by Teachers according to Academic Level Taught**

ICT Tools	Frequency	Gujarat		Karnataka	
		Primary	Secondary	Primary	Secondary
		%	%	%	%
Communicating with Parents	Very often	0.1	1.4	0.0	0.9
	Often	26.6	7.2	0.6	2.1
	Seldom	0.3	2.2	0.2	2.4
	Never	73.0	89.2	99.2	94.6
Monitoring and Evaluating Student's Progress	Very often	0.1	1.6	0.3	1.1
	Often	26.7	8.0	0.9	4.6
	Seldom	0.5	4.5	0.3	4.8
	Never	72.7	85.9	98.5	89.5
Preparing Reports	Very often	0.3	3.3	0.4	1.7
	Often	26.6	8.7	0.2	4.4
	Seldom	1.0	3.5	0.9	5.2
	Never	72.1	84.4	98.4	88.7
Further Personal Development	Very often	0.4	3.1	0.3	1.4
	Often	26.8	8.7	0.4	3.1
	Seldom	0.5	2.2	0.8	4.2
	Never	72.3	86.0	98.5	91.2

The acquisition of only a low level of skills, even after having some experience of using computers is apparent when the data is assessed with respect to the expertise acquired in various applications. Even though 89.4% teachers in Karnataka have been familiar with computers for less than an year, they have never used ICT for finding information and educational material. Again, though 82.3% of the teachers in Gujarat are similarly familiar they have never used computers for preparing a report. Generally though there is a positive correlation with the number of years that a teacher has used computers and the frequency of his using ICT tools for various applications.

**Table : T 21.6**  
**Frequency of Using ICT Tools by Teachers as determined by Experience of Using Computers**

ICT Tools	Frequency	No. of Years Using Computers									
		GUJARAT					KARNATAKA				
		Less Than One Year	1 – 2 Years	2 – 4 Years	4 – 6 Years	Not Responded	Less Than One Year	1 – 2 Years	2 – 4 Years	4 – 6 Years	Not Responded
		%	%	%	%	%	%	%	%	%	%
Teaching - Learning for Specific Subjects	Very often	3.6	5.0	11.3	34.3	0.2	6.5	4.9	12.3	25.0	0.1
	Often	9.8	39.7	27.0	10.4	8.2	9.9	29.3	39.4	20.0	0.5
	Seldom	8.5	7.7	20.6	16.4	0.5	7.8	22.5	16.1	17.5	0.1
	Never	78.1	47.6	41.1	38.8	91.1	75.8	43.3	32.3	37.5	99.3
Teaching Computer Skills	Very often	1.3	4.2	14.2	16.4	0.1	3.8	2.9	12.3	35.0	0.2
	Often	9.6	41.8	14.9	20.9	10.3	5.8	14.3	21.3	12.5	0.4
	Seldom	9.6	3.9	19.1	11.9	0.5	4.4	13.0	12.3	0.0	0.0
	Never	79.4	50.1	51.8	50.7	89.1	86.0	69.7	54.2	52.5	99.4
Finding Information and Educational Material	Very often	1.1	3.2	12.1	16.4	0.2	0.3	4.9	2.6	15.0	0.0
	Often	11.3	40.9	14.2	26.9	10.1	6.1	14.0	27.1	15.0	0.4
	Seldom	4.9	6.6	18.4	11.9	0.5	4.1	12.7	14.2	12.5	0.0
	Never	82.6	49.3	55.3	44.8	89.2	89.4	68.4	56.1	57.5	99.6
Making Presentation/ Lectures	Very often	0.6	1.3	4.3	16.4	0.0	0.0	4.6	6.5	10.0	0.0
	Often	12.1	40.7	16.3	32.8	10.6	3.4	14.3	22.6	15.0	0.3
	Seldom	3.6	7.2	21.3	11.9	0.2	3.4	8.5	18.1	7.5	0.0
	Never	83.8	50.8	58.2	38.8	89.2	93.2	72.6	52.9	67.5	99.6

**Table : T 21.6 (Continued)**  
**Frequency of Using ICT Tools by Teachers as determined by Experience of Using Computers**

ICT Tools	Frequency	No. of Years Using Computers									
		Gujarat					Karnataka				
		Less Than One Year	1 – 2 Years	2 – 4 Years	4 – 6 Years	Not Responded	Less Than One Year	1 – 2 Years	2 – 4 Years	4 – 6 Years	Not Responded
		%	%	%	%	%	%	%	%	%	%
Preparing Lessons	Very often	0.9	1.2	7.1	17.9	0.0	0.3	8.5	10.3	15.0	0.1
	Often	11.9	41.0	17.0	31.3	10.6	7.5	13.4	21.9	20.0	0.3
	Seldom	3.6	6.0	11.3	10.4	0.2	3.4	11.1	17.4	20.0	0.0
	Never	83.6	51.8	64.5	40.3	89.2	88.7	67.1	50.3	45.0	99.6
Communicating with Students	Very often	0.9	1.0	6.4	14.9	0.0	2.4	9.8	12.3	12.5	0.1
	Often	11.7	40.4	9.2	26.9	10.5	3.1	9.4	19.4	10.0	0.4
	Seldom	2.5	3.8	12.1	6.0	0.3	3.1	10.7	9.7	2.5	0.0
	Never	84.9	54.7	72.3	52.2	89.2	91.5	70.0	58.7	75.0	99.5
Communicating with other Teachers	Very often	0.8	1.2	3.5	6.0	0.1	1.0	7.2	7.1	2.5	0.0
	Often	11.5	40.0	8.5	26.9	10.5	1.4	6.5	17.4	7.5	0.4
	Seldom	2.5	1.9	9.2	11.9	0.3	4.8	8.5	9.0	12.5	0.0
	Never	85.3	56.9	78.7	55.2	89.1	92.8	77.9	66.5	77.5	99.6
Communicating with Parents	Very often	1.5	1.2	2.1	4.5	0.1	0.7	2.3	2.6	7.5	0.0
	Often	11.1	40.1	6.4	31.3	10.4	1.7	5.2	11.6	2.5	0.1
	Seldom	2.3	1.0	6.4	6.0	0.4	2.0	4.9	9.7	12.5	0.1
	Never	85.1	57.7	85.1	58.2	89.1	95.6	87.6	76.1	77.5	99.7
Monitoring and Evaluating Student's Progress	Very often	0.8	0.9	7.1	9.0	0.0	0.3	3.3	4.5	7.5	0.1
	Often	12.5	40.6	9.2	26.9	10.6	4.4	10.7	21.9	17.5	0.1
	Seldom	3.8	5.0	9.9	9.0	0.2	3.1	13.7	16.8	10.0	0.2
	Never	83.0	53.6	73.8	55.2	89.2	92.2	72.3	56.8	65.0	99.6
Preparing Reports	Very often	1.3	2.6	12.1	17.9	0.1	0.3	3.9	7.7	20.0	0.1
	Often	12.1	41.8	12.8	28.4	10.4	2.7	10.7	18.1	12.5	0.1
	Seldom	4.3	3.6	8.5	7.5	0.3	3.8	15.3	21.9	15.0	0.1
	Never	82.3	52.0	66.7	46.3	89.2	93.2	70.0	52.3	52.5	99.6
Further Personal Development	Very often	1.5	2.9	7.8	17.9	0.2	0.3	1.3	9.7	17.5	0.0
	Often	11.9	42.0	10.6	32.8	10.5	2.4	9.4	9.7	10.0	0.2
	Seldom	3.2	1.8	4.3	3.0	0.3	4.1	13.0	15.5	7.5	0.1
	Never	83.4	53.3	77.3	46.3	89.0	93.2	76.2	65.2	65.0	99.6

An interesting finding of the survey is that no teacher in Gujarat who has worked for more than 20 years ever uses ICT for any purpose what so ever. Possibly teachers in the older age group have by design not been imparted training in ICT tools. This is more or less true for teachers in Karnataka also, though the range of teachers who have never used ICT for any purpose and have more than 20 years of experience ranges from 90.3% to 98.5%. The number of years of experience as a teacher is not an important variable to explain the frequency of using ICT tools in various applications in the two States.

**Table : T 21.7**  
**Frequency of Using ICT Tools by Teachers as determined by years of Experience**

ICT Tools	Frequency	Experience in Years							
		Gujarat				Karnataka			
		Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years	Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years
		%	%	%	%	%	%	%	%
Teaching - Learning for Specific Subjects	Very often	2.7	3.1	2.1	0.0	0.6	5.2	1.1	1.3
	Often	6.7	15.8	21.1	0.0	3.5	5.4	8.1	4.8
	Seldom	5.3	4.9	2.7	0.0	1.8	3.0	4.6	3.7
	Never	85.3	76.2	74.1	100.0	94.2	86.3	86.2	90.3
Teaching Computer Skills	Very often	4.0	2.3	1.1	0.0	1.2	5.8	0.5	0.9
	Often	6.7	17.2	21.6	0.0	1.8	3.9	4.0	2.4
	Seldom	2.7	4.1	2.7	0.0	1.2	1.1	3.2	2.4
	Never	86.7	76.5	74.7	100.0	95.9	89.2	92.3	94.4
Finding Information and Educational Material	Very often	2.7	1.9	1.3	0.0	0.6	1.8	0.5	0.6
	Often	9.3	17.2	21.9	0.0	2.9	4.3	4.4	1.9
	Seldom	2.7	3.9	1.6	0.0	0.6	1.9	3.1	1.7
	Never	85.3	77.0	75.2	100.0	95.9	92.0	92.0	95.7

**Table : T 21.7 (Continued)**  
**Frequency of Using ICT Tools by Teachers as determined by years of Experience**

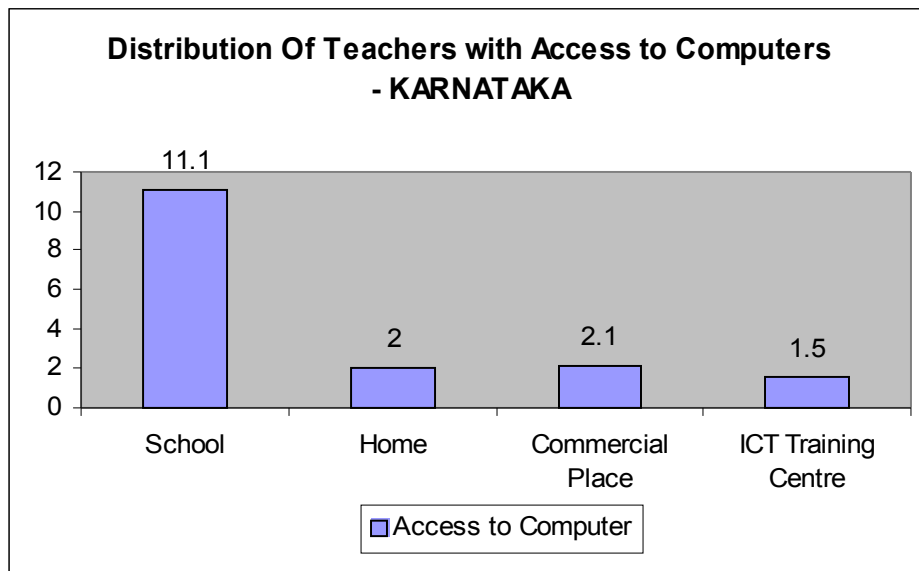
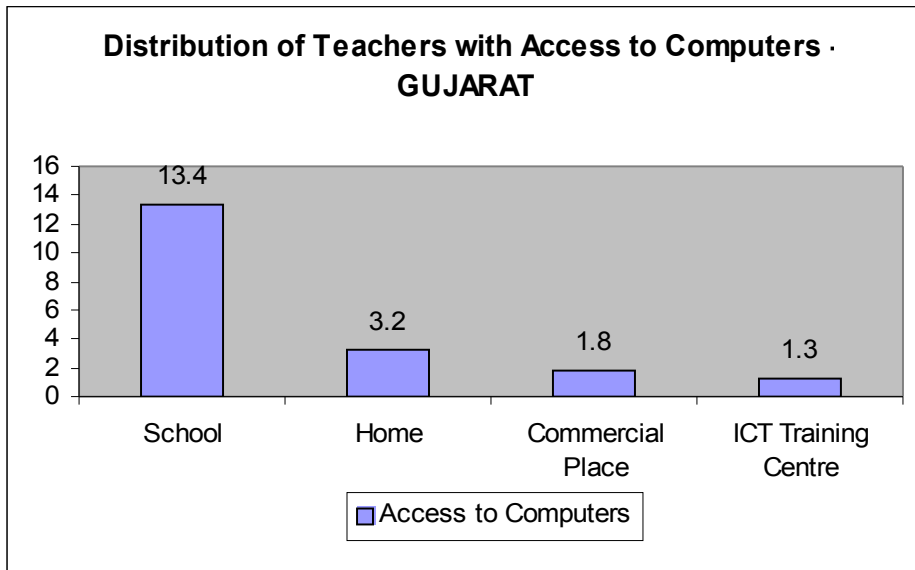
ICT Tools	Frequency	Experience in Years							
		Gujarat				Karnataka			
		Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years	Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years
		%	%	%	%	%	%	%	%
Making Presentation/ Lectures	Very often	0.0	1.0	0.5	0.0	0.0	2.1	0.5	0.9
	Often	6.7	18.0	21.3	0.0	1.8	3.3	4.0	1.7
	Seldom	2.7	3.8	1.3	0.0	1.2	2.1	2.7	1.5
	Never	90.7	77.3	76.8	100.0	97.1	92.5	92.8	95.9
Preparing Lessons	Very often	0.0	1.1	1.1	0.0	1.2	2.6	1.4	1.3
	Often	8.0	18.0	21.3	0.0	1.2	3.6	4.3	2.6
	Seldom	1.3	3.0	1.3	0.0	0.6	1.4	3.5	1.5
	Never	90.7	77.9	76.3	100.0	97.1	92.4	90.8	94.6
Communicating with Students	Very often	0.0	1.0	0.8	0.0	1.8	3.6	1.5	1.9
	Often	8.0	17.2	21.6	0.0	0.6	2.1	3.7	0.6
	Seldom	1.3	2.3	0.5	0.0	1.2	1.2	2.4	1.9
	Never	90.7	79.5	77.1	100.0	96.5	93.1	92.5	95.5
Communicating with other Teachers	Very often	0.0	0.7	0.8	0.0	1.2	2.1	0.8	1.3
	Often	8.0	17.0	21.6	0.0	1.2	1.7	2.7	0.6
	Seldom	0.0	1.9	0.5	0.0	1.8	1.8	2.5	0.9
	Never	92.0	80.4	77.1	100.0	95.9	94.5	94.0	97.2
Communicating with Parents	Very often	1.3	0.7	1.1	0.0	1.2	0.6	0.6	0.2
	Often	8.0	17.0	21.1	0.0	0.0	1.8	1.7	0.4
	Seldom	0.0	1.4	0.3	0.0	0.6	1.2	1.7	0.9
	Never	90.7	81.0	77.6	100.0	98.2	96.4	96.0	98.5

**Table : T 21.7 (Continued)**  
**Frequency of Using ICT Tools by Teachers as determined by years of Experience**

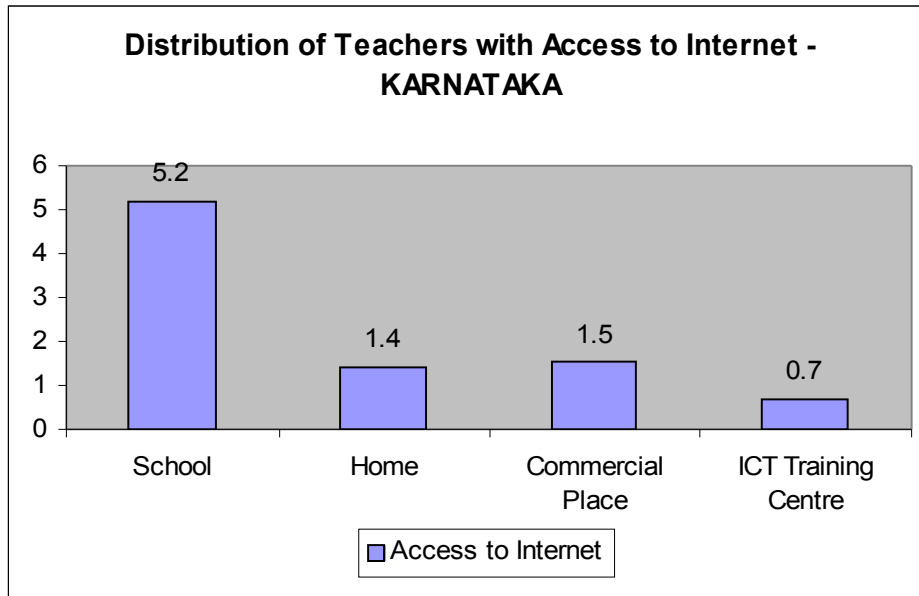
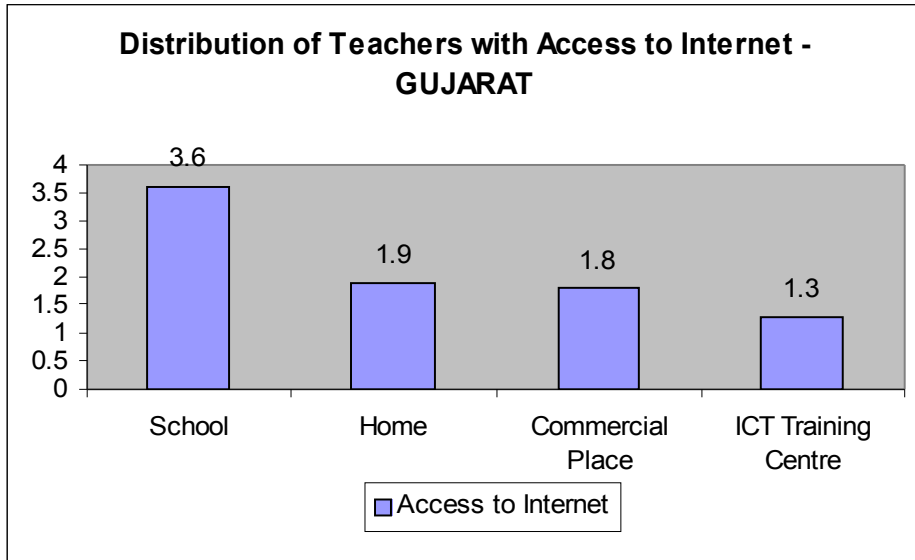
ICT Tools	Frequency	Experience in Years							
		Gujarat				Karnataka			
		Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years	Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years
		%	%	%	%	%	%	%	%
Monitoring and Evaluating Student's Progress	Very often	0.0	0.9	0.5	0.0	1.2	1.0	0.8	0.4
	Often	9.3	17.3	21.9	0.0	1.8	3.3	3.5	1.1
	Seldom	0.0	2.7	1.1	0.0	1.8	2.5	3.1	2.2
	Never	90.7	79.1	76.5	100.0	95.3	93.2	92.7	96.3
Preparing Reports	Very often	1.3	1.8	1.1	0.0	0.6	1.7	1.2	0.4
	Often	8.0	17.7	21.9	0.0	1.2	2.2	3.0	1.1
	Seldom	0.0	2.5	1.1	0.0	2.3	3.9	3.4	2.4
	Never	90.7	78.0	76.0	100.0	95.9	92.3	92.4	96.1
Further Personal Development	Very often	1.3	1.8	1.1	0.0	0.0	1.7	0.9	0.2
	Often	8.0	17.8	22.1	0.0	0.6	1.4	2.6	1.1
	Seldom	1.3	1.4	0.8	0.0	1.2	4.0	2.5	1.9
	Never	89.3	79.0	76.0	100.0	98.2	93.0	94.1	96.8

The teachers were asked to indicate whether they have access to computers and Internet at different locations like the school, at their residence, at a commercial place like a cyber café or an ICT training center. It was found that in both the States access of teachers to computers as well as the Internet was maximum at the school itself. This fact was noticeable in all the Districts.

**Figure : T 22.1**



**Figure : T 22.1**



As would be expected, schools located in urban areas had more access in the two States to both Computers and the Internet. However, the maximum access remained at the school.

**Table : T 22.2**  
**Area Orientation of Teachers with Access to Computers and Internet**

Access to	Access at	GUJARAT				KARNATAKA			
		Urban	Semi-urban	Rural	Total	Urban	Semi-urban	Rural	Total
		%	%	%	%	%	%	%	%
Computers	School	24.5	14.7	7.0	13.4	13.0	18.7	7.9	11.1
	Home	5.9	7.3	1.1	3.2	3.0	4.3	0.7	2.0
	Commercial Place	3.8	1.4	0.7	1.8	3.2	3.0	0.9	2.1
	ICT Training Centre	3.1	0.7	0.3	1.3	1.6	2.7	1.1	1.5
Internet	School	7.0	6.3	1.3	3.6	6.1	9.4	3.5	5.2
	Home	4.4	2.4	0.4	1.9	1.8	2.3	0.8	1.4
	Commercial Place	4.2	1.0	0.5	1.8	2.5	2.0	0.5	1.5
	ICT Training Centre	2.4	0.7	0.7	1.3	1.0	1.7	0.3	0.7

This trend did not change when the data was analysed from the perspective of Government or Private School teachers. It did suggest that both groups perhaps came from the same socio-economic background.

**Table : T 22.3**  
**Management of Schools & Access of Teachers to Computers & Internet**

Access to	Access at	Gujarat		Karnataka	
		Government/ Public	Private	Government /Public	Private
		%	%	%	%
Computers	School	5.4	22.7	12.1	9.3
	Home	1.1	5.7	1.2	3.5
	Commercial Place	1.0	2.7	1.7	2.7
	ICT Training Centre	0.3	2.4	1.5	1.4
Internet	School	1.4	6.2	6.7	2.4
	Home	0.5	3.5	0.9	2.2
	Commercial Place	0.7	3.0	1.2	1.9
	ICT Training Centre	0.6	2.0	0.7	0.8

Teachers were also asked where did they use computers in the school? It was found that the maximum access of teachers to computers was in the teachers lounge or the staff-room as it is more commonly called in India. The next most accessible place in Gujarat was their own office while it was the computer laboratory in Karnataka. The

least accessible place for a teacher for computers was the library in Gujarat and the library again and other places in Karnataka.

**Table : T 23.1**  
**Location in Schools Where Teachers Use Computers**

Location	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Staff Room	52.7	83.8	20.1	54.7	34.7	23.7	13.6	22.5
In my Office	52.7	83.8	20.0	54.6	1.0	0.2	0.0	0.3
Administrators Office	7.8	11.5	7.3	9.2	1.9	1.6	0.5	1.3
Classrooms	5.4	1.0	3.1	2.8	1.9	0.8	0.8	1.0
Computer Laboratory	45.5	18.5	6.5	21.3	31.0	21.8	12.3	20.4
Library	1.4	0.1	0.0	0.4	0.1	1.0	0.0	0.4
Other Places	1.4	0.2	0.9	0.7	0.3	0.1	0.6	0.3

These findings did not change when data was analysed according to the location of the school where the teachers were teaching – rural or urban.

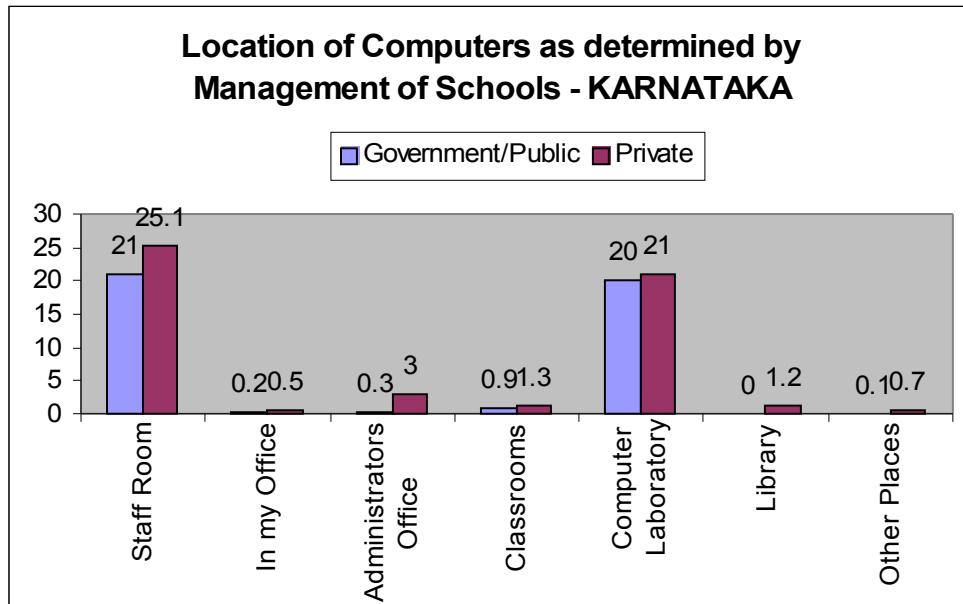
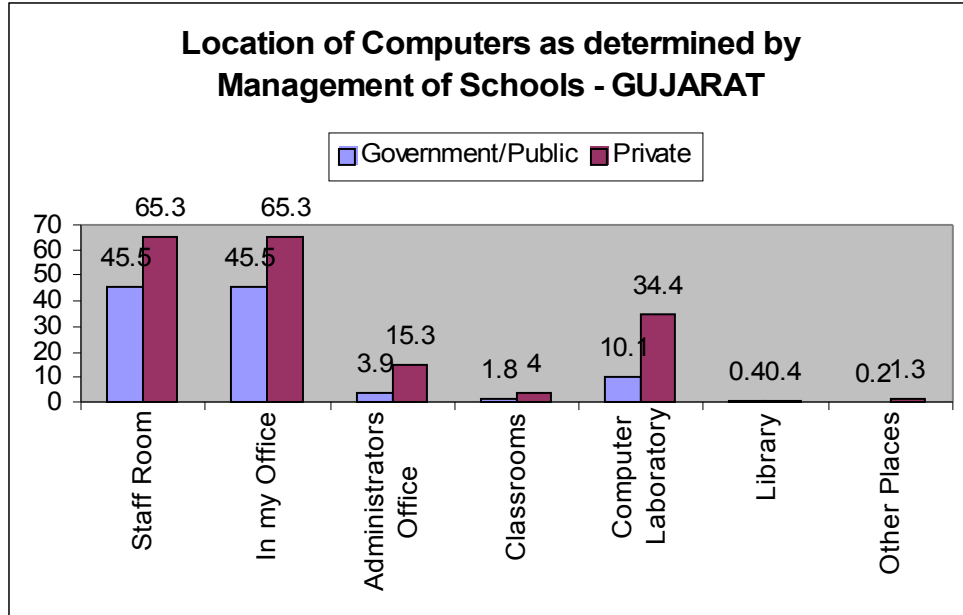
**Table : T 23.2**  
**Location of Computers as determined by Area**

Location	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Staff Room	59.5	50.0	52.7	25.7	29.1	18.4
In my Office	59.5	49.7	52.7	0.5	0.7	0.1
Administrators Office	10.2	14.3	7.8	0.9	3.3	1.2
Classrooms	4.1	6.3	1.6	1.7	0.0	0.7
Computer Laboratory	42.4	19.6	9.8	23.1	28.1	16.5
Library	1.1	0.0	0.1	0.1	0.0	0.8
Other Places	1.1	1.0	0.5	0.5	0.7	0.1

The trend of most access of teachers in Gujarat to computers in the teachers lounge was accentuated in case of Private School teachers. It was also found that they had more access to computers in the laboratories compared to their Government School counter-parts. In Karnataka, while the findings remained the same it was found that

Government School teachers had no access to computers in libraries, obviously because there were none there!

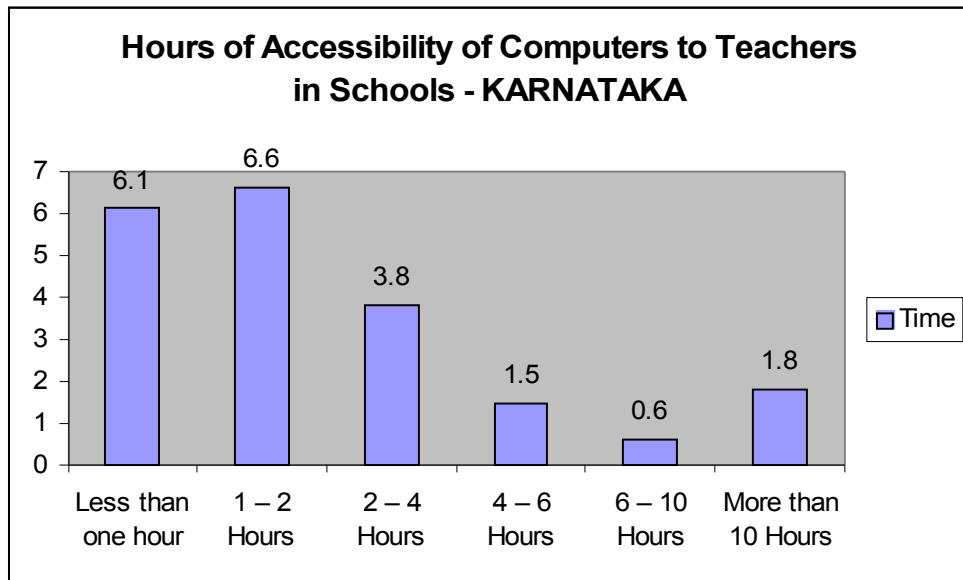
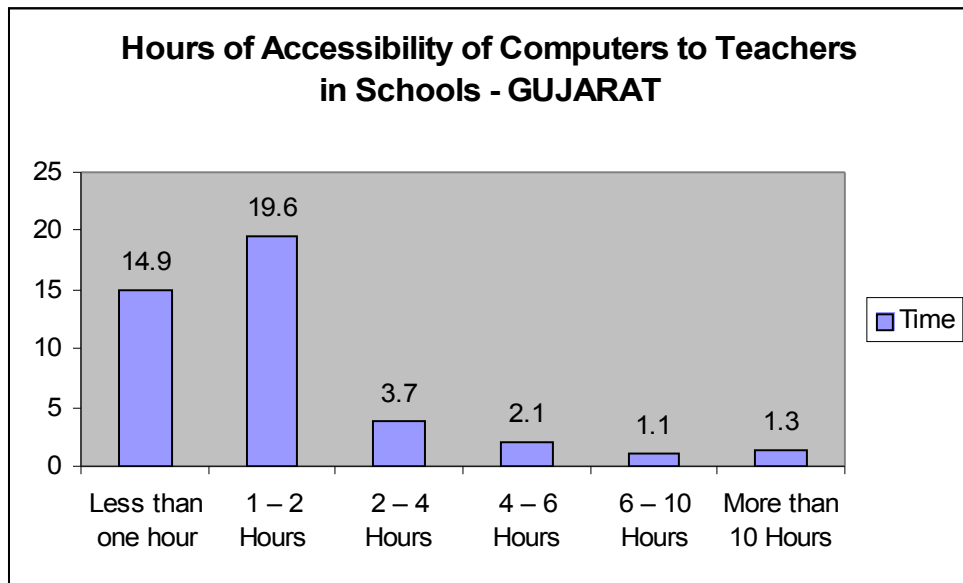
**Figure : T 23.3**



An assessment was made as to how many hours per week were a school's computers accessible to the teachers? The results were not very encouraging. It was

found that in both Gujarat and Karnataka school teachers had access to the school's computer for a maximum of one to two hours per week. Only for 2.4% of the teachers was a computer available to them for more than six hours. However, the number of hours of availability was perhaps more in Gujarat than in Karnataka.

**Figure : T 24.1**



While the results for Gujarat did not change when seen from the urban-rural perspective, in Karnataka it was found that the maximum number of teachers had

access to their school's computer for less than an hour while their rural counter-parts had access ranging from one to two hours.

**Table : T 24.2**  
**Hours of Accessibility of Computers in Schools as determined by location**

Time	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Less than one hour	18.3	19.2	12.4	7.9	6.7	4.4
1 – 2 Hours	20.0	11.9	20.6	6.8	7.7	6.3
2 – 4 Hours	7.3	4.9	1.5	4.6	2.3	3.4
4 – 6 Hours	3.7	6.6	0.5	0.9	3.3	1.7
6 – 10 Hours	1.9	1.0	0.7	0.9	0.7	0.4
More than 10 Hours	2.7	1.7	0.4	2.1	3.0	1.2

There was no discernable difference in accessibility when analysed from the Government/Private School perspective.

**Table : T 24.3**  
**Hours of Accessibility of Computers to Teachers as determined by Management of School**

Time	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
Less than one Hour	9.9	20.7	5.8	6.5
1 – 2 Hours	16.6	23.1	6.6	6.6
2 – 4 Hours	1.1	6.8	3.8	3.8
4 – 6 Hours	0.7	3.8	1.7	1.2
6 – 10 Hours	0.8	1.5	0.4	1.0
More than 10 Hours	0.5	2.2	1.1	2.9

Interestingly, Primary School teachers claimed to have better access to computers than their Secondary School counter-parts in Gujarat. However, in Karnataka the advantage remained with Secondary School teachers.

**Table : T 24.4**

### Hours of Accessibility of Computers to Teachers in School according to Academic level taught

Accessibility of Computers to Teachers for	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Less than one hour	4.7	25.9	2.2	9.3
1 – 2 Hours	17.0	22.4	1.9	10.5
2 – 4 Hours	1.8	5.8	1.5	5.7
4 – 6 Hours	1.4	2.9	1.1	1.9
6 – 10 Hours	0.9	1.3	0.3	0.9
More than 10 Hours	0.7	1.9	1.0	2.4

Very few teachers, it was found have access to computers outside the school. In Karnataka, only 5.4% of the responding teachers used computers outside schools. In Gujarat, the figure was marginally better at 7.5%. Not surprisingly, more teachers in Ahmedabad in Gujarat and Bangalore in Karnataka used computers outside schools than those in the Districts.

**Table : T 25.1  
Teachers Using Computers Outside School**

	Gujarat				Karnataka			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
	%	%	%	%	%	%	%	%
Yes	16.7	5.1	3.5	7.5	10.7	4.6	3.0	5.4
No	76.5	84.0	87.3	83.2	43.5	39.3	16.4	31.8
Not Responded	6.8	10.8	9.2	9.3	45.8	56.1	80.6	62.9

As would be expected, more teachers in urban areas used computers outside school hours in both Gujarat and Karnataka.

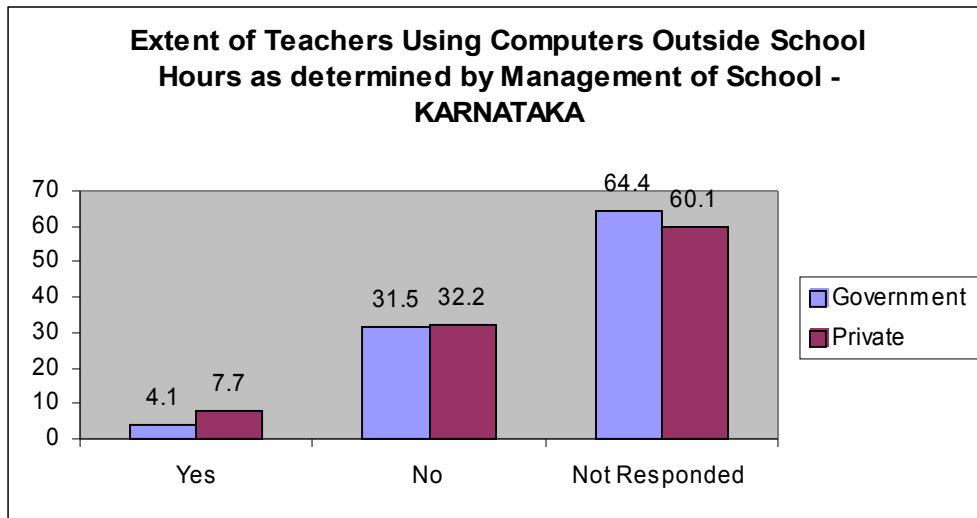
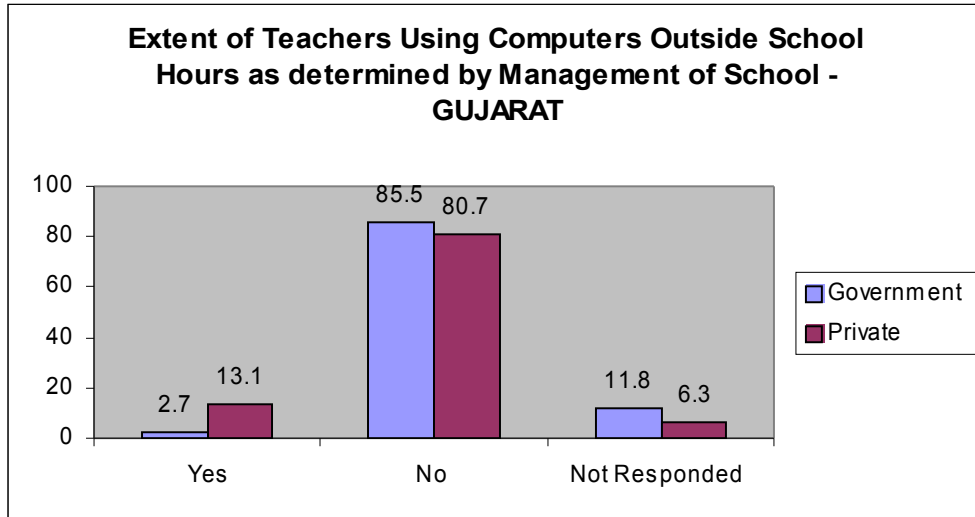
**Table : T 25.2  
Area orientation of Teachers Using Computers Outside School**

	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
	%	%	%	%	%	%

Yes	14.7	9.4	3.1	6.6	9.7	3.5
No	76.5	85.7	86.7	35.1	28.1	29.7
Not Responded	8.8	4.9	10.2	58.4	62.2	66.8

It was also found that more Private School teachers used ICT outside the school hours in both the States.

**Figure : T 25.3**



Not surprisingly, more Secondary School teachers used computers outside school in both Gujarat and Karnataka.

**Table : T 25.4**  
**Academic Level taught by Teachers Using Computers Outside School**

	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Yes	2.6	12.8	4.0	6.4
No	83.9	82.5	24.7	37.6
Not Responded	13.5	4.7	71.2	56.0

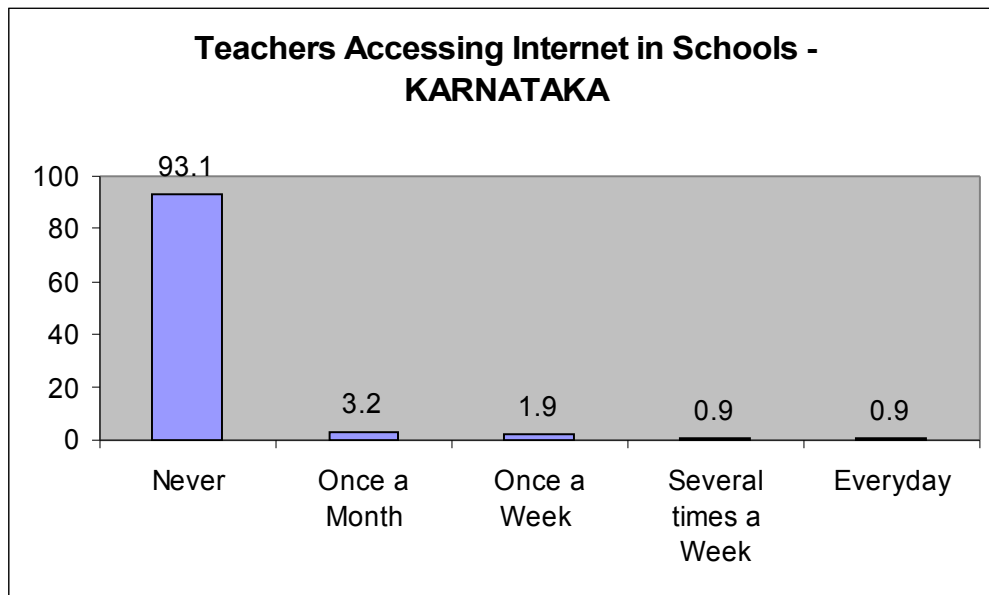
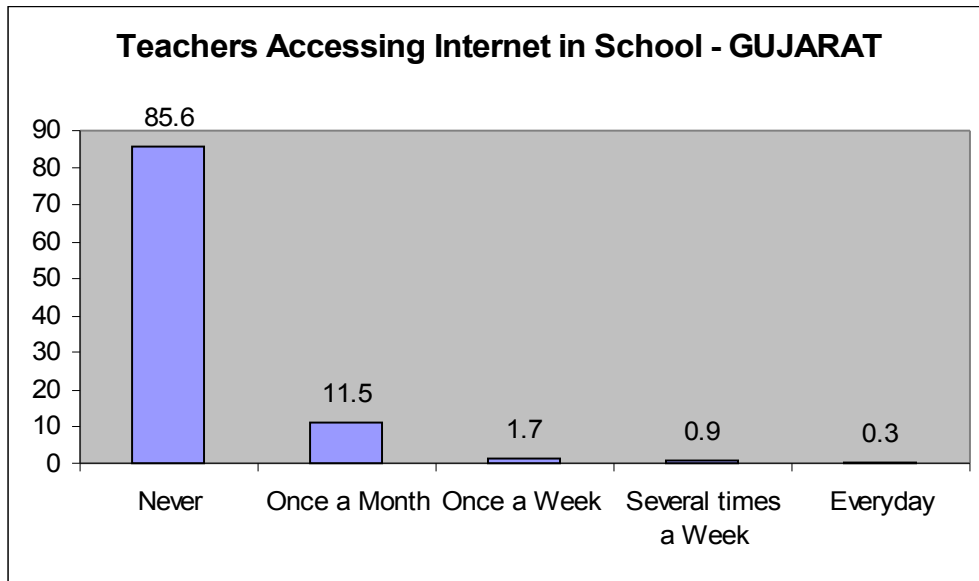
Interestingly, when the data was correlated with the number of years that a teacher had been using computers it was found to be positively correlated. This was true for Gujarat as well as Karnataka. In simple terms, more teachers who had been using computers for a number of years found the need to use them outside school hours also.

**Table : T 25.5  
Usage of Computer Outside School by Teachers  
as determined by Years of Computer Use.**

Number of Years of Computer Use	Yes	No	Not Responded
Less than one year	8.9	88.5	2.6
1 – 2 Years	10.8	87.0	2.2
2 – 4 Years	31.2	66.0	2.8
4 – 6 Years	64.2	35.8	0.0
Not Responded	1.7	83.4	15.0
<b>Gujarat</b>	<b>7.5</b>	<b>83.2</b>	<b>9.3</b>
Less than one year	9.2	52.9	37.9
1 – 2 Years	13.0	68.7	18.2
2 – 4 Years	32.9	50.3	16.8
4 – 6 Years	62.5	27.5	10.0
Not Responded	1.0	22.9	76.1
<b>Karnataka</b>	<b>5.4</b>	<b>31.8</b>	<b>62.9</b>

Surprisingly, even where access to the Internet was available in the schools, 85.6% of the Teachers in Gujarat and 93.1% in Karnataka, never found the need or had the inclination to use it. The maximum usage by the teachers was once a month in both the States. Less than 1% in the two States accessed the Internet every day (0.3% in Gujarat and 0.9% in Karnataka).

**Figure : T 26.1**



The findings did not change even when analysed from the point of view of location of the school. In Karnataka, however there was marginally more use of the internet by teachers in urban areas.

**Table : T 26.2**  
**Area Orientation of Teachers Accessing Internet in School**

Frequency of Using Internet in School	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Never	85.8	88.8	85.1	91.7	93.0	94.4
Once a Month	8.1	5.6	14.3	3.5	2.7	3.1
Once a Week	4.3	1.0	0.3	2.6	0.7	1.5
Several times a Week	1.3	4.5	0.2	1.0	2.3	0.5
Everyday	0.6	0.0	0.1	1.2	1.3	0.5

There was hardly any difference which could be ascertained when viewed from the Government/Private School divide in both the States.

**Table : T 26.3**  
**Management of Schools & Teachers Accessing Internet in School**

Frequency of Using Internet in School	Gujarat		Karnataka	
	Government/ Public	Private	Government/ Public	Private
Never	86.7	84.4	92.2	94.8
Once a Month	12.4	10.5	4.2	1.6
Once a Week	0.2	3.4	1.9	1.8
Several times a Week	0.7	1.2	0.9	0.9
Everyday	0.1	0.5	0.9	0.8

Interestingly, more Secondary School teachers who have access to the Internet do not use it in the case of Gujarat when compared to Primary School Teachers while it is just the reverse in Karnataka.

**Table : T 26.4**  
**Academic Level taught by Teachers Accessing Internet in School**

Frequency of Using Internet in School	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Never	82.6	88.9	97.3	89.7
Once a Month	15.9	6.8	1.1	5.0
Once a Week	1.3	2.0	1.1	2.5
Several times a Week	0.1	1.8	0.2	1.4

Everyday	0.1	0.5	0.3	1.4
----------	-----	-----	-----	-----

The frequency of using the Internet in school was positively correlated with the number of years that a teacher had been using computers. This was more true of teachers who had been using computers for less than 4 years. In both the States hardly any teacher used the net every day. An analysis of the teachers who used the net several times a week found that the maximum frequency was of those teachers who had been using computers for the last two to four years in Gujarat and one to two years in Karnataka. There was perhaps a sense of fatigue which set in after some time.

**Table : T 26.5**  
**Years of Computer Use of Teachers Accessing Internet in School**

Years of Computer Use	Frequency				
	Never	Once a Month	Once a Week	Several Times a Week	Everyday
Less than one year	90.2	7.9	1.1	0.6	0.2
1 – 2 Years	57.1	38.8	2.9	0.7	0.4
2 – 4 Years	73.8	9.9	5.0	11.3	0.0
4 – 6 Years	50.7	16.4	23.9	6.0	3.0
Not Responded	97.8	1.8	0.2	0.1	0.1
<b>Gujarat</b>	<b>85.6</b>	<b>11.5</b>	<b>1.7</b>	<b>0.9</b>	<b>0.3</b>
Less than one year	88.7	4.8	4.8	1.0	0.7
1 – 2 Years	72.3	13.0	5.9	6.2	2.6
2 – 4 Years	72.9	16.8	7.7	1.9	0.6
4 – 6 Years	62.5	15.0	7.5	5.0	10.0
Not Responded	98.4	0.6	0.4	0.0	0.5
<b>Karnataka</b>	<b>93.1</b>	<b>3.2</b>	<b>1.9</b>	<b>0.9</b>	<b>0.9</b>

When asked to indicate the purpose for which the teachers in both the States were using the Internet, the response was the same. The maximum usage was for teaching specific lessons in various subjects. This was true for all the Districts except Patan.

**Table : T 27.1**  
**Teachers Using Internet in School Work**

Purpose	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Teaching Specific Lessons in Various Subject	12.8	2.0	2.8	5.0	10.4	7.0	20.8	12.8
Making Presentation/ Lectures	7.5	0.5	1.0	2.4	7.3	2.9	5.2	4.7
Preparing Lessons	9.3	3.5	1.3	4.2	10.4	4.8	14.2	9.5
Communicating with Students	2.9	0.4	2.1	1.6	6.5	2.8	12.2	7.1
Communicating with other Teachers	1.9	1.8	1.0	1.5	2.4	1.2	6.6	3.5
Accessing and Using Online Assessment Tools	1.5	0.1	0.2	0.5	2.0	0.8	2.2	1.6
Preparing Papers and Teaching Materials	8.5	4.9	0.9	4.5	8.4	2.9	9.8	6.7
Collecting Handouts and Reference Materials	6.8	0.4	1.7	2.4	7.3	2.7	8.8	6.0

There was no difference in Karnataka between the urban and rural areas as far as use of the Internet was concerned. In Gujarat however in the urban areas it was most used for teaching specific lessons in various subjects, while in rural areas it was most used for preparing papers and teaching materials.

**Table : T 27.2**  
**Use of Internet in School Work according to Area**

Purpose	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Teaching Specific Lessons in Various Subject	10.0	5.2	2.2	9.5	18.1	14.6
Making Presentation/ Lectures	5.5	2.1	0.8	4.5	4.7	5.0
Preparing Lessons	7.8	3.5	2.3	7.3	15.4	10.3
Communicating with Students	2.3	2.4	1.0	4.6	12.0	8.3
Communicating with other Teachers	1.7	2.8	1.2	2.0	5.0	4.4
Accessing and Using Online Assessment Tools	1.3	0.0	0.1	1.3	0.3	2.1
Preparing Papers and Teaching Materials	8.1	4.9	2.4	5.2	7.4	7.8
Collecting Handouts and Reference Materials	5.6	3.8	0.4	5.3	4.0	7.0

The purpose for which the Internet was used the least by teachers in both the States, whether in Government Schools or Private Schools was in accessing and using online assessment tools. There was no difference in the purpose for which the Internet was most used in Government and Private Schools in Karnataka where it was most used in teaching specific lessons in various subjects. There was however a difference in this respect between Government and Private Schools in Gujarat where Private Schools used the Internet most for teaching specific lessons in various subjects but Government School teachers used it most for preparing lessons.

**Table : T 27.3**  
**Use of Internet in Schoolwork as determined by Management of School**

Purpose	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
Teaching Specific Lessons in Various Subject	1.7	8.8	14.9	9.2
Making Presentation/ Lectures	1.4	3.7	5.0	4.3
Preparing Lessons	2.6	6.1	11.4	6.2
Communicating with Students	0.2	3.1	8.0	5.6
Communicating with other Teachers	0.4	2.9	4.0	2.6
Accessing and Using Online Assessment Tools	0.2	0.8	1.8	1.3
Preparing Papers and Teaching Materials	2.4	6.9	8.2	3.9
Collecting Handouts and Reference Materials	0.6	4.5	6.5	5.1

There was not much of a difference in this respect when the data was examined from the view point of Primary or Secondary Schools. The conclusion generally remained the same.

**Table : T 27.4**  
**Use of Internet in School Work according to Academic Level Taught**

Purpose	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Teaching Specific Lessons in Various Subject	2.2	8.0	8.6	16.3
Making Presentation/ Lectures	1.3	3.7	1.7	7.3
Preparing Lessons	1.8	6.9	4.4	13.7
Communicating with Students	0.3	3.0	5.0	8.9
Communicating with other Teachers	0.3	2.9	1.6	5.0
Accessing and Using Online Assessment Tools	0.3	0.7	0.9	2.2
Preparing Papers and Teaching Materials	1.2	8.1	2.7	9.9
Collecting Handouts and Reference Materials	0.9	4.1	2.2	9.1

When the data of usage of the Internet as a teacher was checked with respect to the number of years that a teacher was using computers it was found to be positively correlated in both Gujarat as well as Karnataka. While only 4% of the teachers in Gujarat who were using computers for less than an year used the Internet for preparing lessons, 17.9% of the teachers made use of it in the experience bracket of 4 – 6 years. Similarly while 6.1% of the teachers in Karnataka who had less than an year’s experience of using computers used the Internet for making presentations or lectures, 22.5% did so after 6 years.

**Table : T 27.5**  
**Use of Internet in School Work as determined by Experience of Using Computers**

Purpose	No. of Years Using Computers									
	Gujarat					Karnataka				
	Less Than One Year	1 – 2 Years	2 – 4 Years	4 – 6 Years	Not Responded	Less Than One Year	1 – 2 Years	2 – 4 Years	4 – 6 Years	Not Responded
	%	%	%	%	%	%	%	%	%	%
Teaching Specific Lessons in Various Subject	5.7	6.3	16.3	46.3	1.8	19.1	29.6	29.7	27.5	8.4
Making Presentation/Lectures	2.8	2.2	21.3	13.4	0.5	6.1	15.6	12.3	22.5	2.3
Preparing Lessons	4.0	7.2	22.7	17.9	1.2	15.7	20.8	21.3	27.5	6.1
Communicating with Students	1.5	2.0	5.7	6.0	0.9	8.5	12.1	9.7	30.0	5.7
Communicating with other Teachers	0.4	2.3	6.4	7.5	1.0	6.1	3.6	5.8	10.0	2.8
Accessing and Using Online Assessment Tools	0.2	0.3	1.4	10.4	0.2	1.4	1.6	3.9	15.0	1.2
Preparing Papers and Teaching Materials	6.8	7.0	19.9	35.8	0.3	9.9	14.7	15.5	35.0	4.1
Collecting Handouts and Reference Materials	0.8	3.2	15.6	32.8	0.4	8.5	12.7	16.8	30.0	3.6

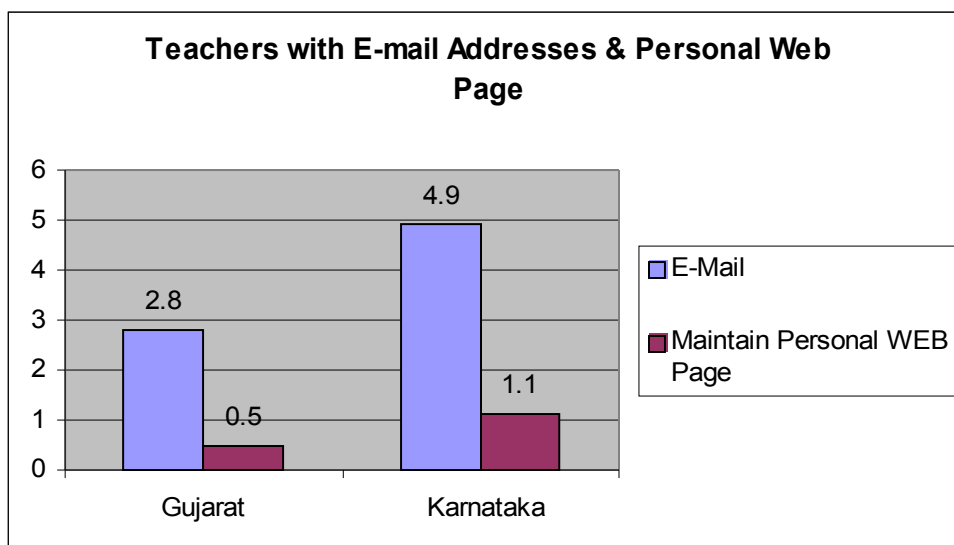
One could not find a positive correlation between the use of Internet by teachers in Karnataka for various purposes with their years of experience as teachers. However, in Gujarat teachers with an experience of upto 5 years use the Net more than those teachers which had no experience at all or those who had experience of a larger number of years.

**Table : T 27.6**  
**Use of Internet in School Work according to Teaching Experience**

Purpose	Experience in Years							
	Gujarat				Karnataka			
	Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years	Nil	Up to 5 Years	6 - 20 Years	21 – 30 Years
	%	%	%	%	%	%	%	%
Teaching Specific Lessons in Various Subject	6.7	5.2	2.9	0.0	12.3	14.1	13.3	9.7
Making Presentation/Lectures	0.0	2.5	2.4	0.0	4.7	5.1	4.8	4.1
Preparing Lessons	5.3	4.3	3.7	0.0	9.9	7.3	10.8	8.7
Communicating with Students	1.3	1.7	0.5	0.0	6.4	6.9	7.3	7.8
Communicating with other Teachers	0.0	1.7	0.5	0.0	5.3	2.6	3.6	3.5
Accessing and Using Online Assessment Tools	1.3	0.5	0.0	0.0	2.9	1.8	1.7	0.4
Preparing Papers and Teaching Materials	6.7	4.7	2.7	0.0	11.7	6.5	7.0	4.3
Collecting Handouts and Reference Materials	4.0	2.7	0.5	0.0	10.5	6.1	6.0	4.3

The number of teachers who had an e-mail ID or a personal web-page was very low in both the States. Hardly 4.9% of the teachers in Karnataka and 2.8% of the teachers in Gujarat had an E-mail ID. 1.1% teachers in Karnataka and 0.5% in Gujarat had a personal web-page. The numbers were thus marginally more in Karnataka. The maximum number of teachers who had an E-mail ID were in Bangalore (9.9%). They also maintained the largest number of personal web-pages. The last in this respect was Patan (**Annexure XII**).

**Figure : T 28.1**



Not surprisingly, school teachers of urban areas in both Gujarat and Karnataka have more number of E-mail addresses or personal web-pages. This was true for Private Schools as compared to Government Schools and Secondary School teachers when compared to their Primary School counter-parts in both the States.

**Table : T 28.2**  
**Area Orientation of Teachers with E-mail Addresses & Personal Web Page**

	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
E-mail	6.4	5.2	0.4	5.7	9.7	3.3
Maintain Personal Web Page	0.8	1.7	0.2	1.3	2.0	0.9

**Table : T 28.3**

## School Management & Teachers with E-mail Addresses & Personal Web Page

	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
E-mail	0.9	5.1	4.4	5.9
Maintain Personal Web Page	0.0	1.1	1.1	1.2

**Table : T 28.4**  
**Academic Level taught by Teachers with E-mail Addresses & Personal Web Page**

	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
E-mail	1.5	4.2	2.5	6.9
Maintain Personal Web Page	0.3	0.7	0.6	1.5

As noticed earlier in the case of use of the Internet, there was a positive correlation between the number of years that a Teacher had been using computers and the possibility of her having an E-mail id or a personal web page. The details are provided in the Table : T 28.5.

**Table : T 28.5**  
**Years of Use of Computers by Teachers with E-mail Address & Personal Web Page**

Number of Years Using Computers	E-mail Address	Personal WEB Page
Less than one year	2.5	0.6
1 – 2 Years	2.3	0.1
2 – 4 Years	11.3	2.8
4 – 6 Years	49.3	4.5
Not Responded	0.6	0.3
<b>Gujarat</b>	<b>2.8</b>	<b>0.5</b>
Less than one year	8.9	0.7
1 – 2 Years	10.4	3.3
2 – 4 Years	30.3	3.2
4 – 6 Years	60.0	5.0
Not Responded	1.0	0.7
<b>Karnataka</b>	<b>4.9</b>	<b>1.1</b>

### III. STUDENTS

As has been mentioned earlier a total of 35,547 students responded to the Questionnaire out of which 16,839 were from the State of Gujarat and 18,708 from Karnataka. The details are depicted in Table : S 4.1 It would be seen from the Table that Ahmedabad and Bangalore are predominantly urban whereas the Districts of Patan, Surendranagar, Bellary and Mandya are largely rural. 34.2% of the responding students classified themselves to be urban based while 57.3% were from rural areas. Another 8.5% were from semi-urban areas. These figures also broadly approximate the national proportion of urban and rural areas.

**Table : S 4.1**  
**Area wise Distribution of Students**

District/State	Urban		Semi-urban		Rural		Total	
	N	%	N	%	N	%	N	%
Ahmedabad	3593	97.1	8	0.2	101	2.7	3702	100.0
Patan	1205	18.0	311	4.6	5187	77.4	6703	100.0
Surendranagar	74	1.2	1174	18.2	5186	80.6	6434	100.0
<b>Gujarat</b>	<b>4872</b>	<b>28.9</b>	<b>1493</b>	<b>8.9</b>	<b>1047</b>	<b>62.2</b>	<b>1683</b>	<b>100.0</b>
Bangalore	3273	80.6	450	11.1	340	8.4	4063	100.0
Bellary	2472	32.4	403	5.3	4743	62.3	7618	100.0
Mandya	1537	21.9	666	9.5	4824	68.6	7027	100.0
<b>Karnataka</b>	<b>7282</b>	<b>38.9</b>	<b>1519</b>	<b>8.1</b>	<b>9907</b>	<b>53.0</b>	<b>1870</b>	<b>100.0</b>
<b>Total</b>	<b>12154</b>	<b>34.2</b>	<b>3012</b>	<b>8.5</b>	<b>2038</b>	<b>57.3</b>	<b>3554</b>	<b>100.0</b>

Table : S 5.1 depicts the proportion of school students going to Government or Public Schools and those attending private schools. The presence of private schools is more than discernable in urban areas and as can be seen from the Table 69.9% of the school students surveyed in Ahmedabad attend private schools. The two predominantly rural Districts of Patan and Surendranagar have more than half of the students surveyed going to Government Schools. A major proportion of students surveyed in Karnataka were from Government Schools. The total number of students studying in Government Schools and those in Private schools were 57.9% and 42.1% respectively.

**Table : S 5.1**  
**Distribution of Students according to Management**

District/State	Government/Public		Private	
	N	%	N	%
Ahmedabad	1143	30.9	2559	69.1
Patan	3709	55.3	2994	44.7
Surendranagar	3562	55.4	2872	44.6
<b>Gujarat</b>	<b>8414</b>	<b>50.0</b>	<b>8425</b>	<b>50.0</b>
Bangalore	2101	51.7	1962	48.3
Bellary	4694	61.6	2924	38.4
Mandya	5379	76.5	1648	23.5
<b>Karnataka</b>	<b>12174</b>	<b>65.1</b>	<b>6534</b>	<b>34.9</b>
<b>Total</b>	<b>20588</b>	<b>57.9</b>	<b>14959</b>	<b>42.1</b>

While the proportion of primary school students surveyed was 51.9%, that of secondary school's were 48.1%, in Gujarat. The respective proportions in Karnataka were 38.2% and 61.8% as shown in Table : S 7.1 below. Out of the total number of students surveyed (35,547) 44.7% were from the primary classes and 55.3% were from the secondary ones.

**Table : S 7.1**  
**Academic level of Students**

District/State	Primary		Secondary	
	N	%	N	%
Ahmedabad	2238	60.5	1464	39.5
Patan	3764	56.2	2939	43.8
Surendranagar	2744	42.6	3690	57.4
<b>Gujarat</b>	<b>8746</b>	<b>51.9</b>	<b>8093</b>	<b>48.1</b>
Bangalore	1497	36.8	2566	63.2
Bellary	3278	43.0	4340	57.0
Mandya	2368	33.7	4659	66.3
<b>Karnataka</b>	<b>7143</b>	<b>38.2</b>	<b>11565</b>	<b>61.8</b>
<b>Total</b>	<b>15889</b>	<b>44.7</b>	<b>19658</b>	<b>55.3</b>

The gender distribution of the students surveyed was also analysed. 52.9% of the students were boys in Gujarat and 47.1% were girls. The respective proportions in Karnataka were 49.8% and 50.2%. The overall totals were 51.3% boys and 48.8% girls. The number of girls ranged from a low of 36.8% in Surendranagar to a high of 57% in Ahmedabad, both in the western State of Gujarat (**Annexure-XIII**).

**Figure : S 9.1**

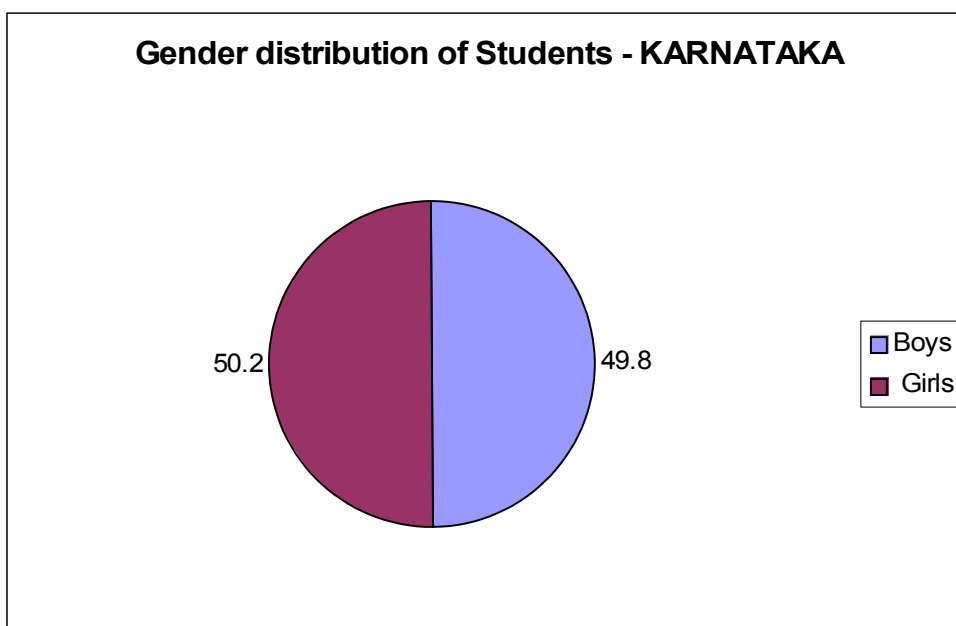
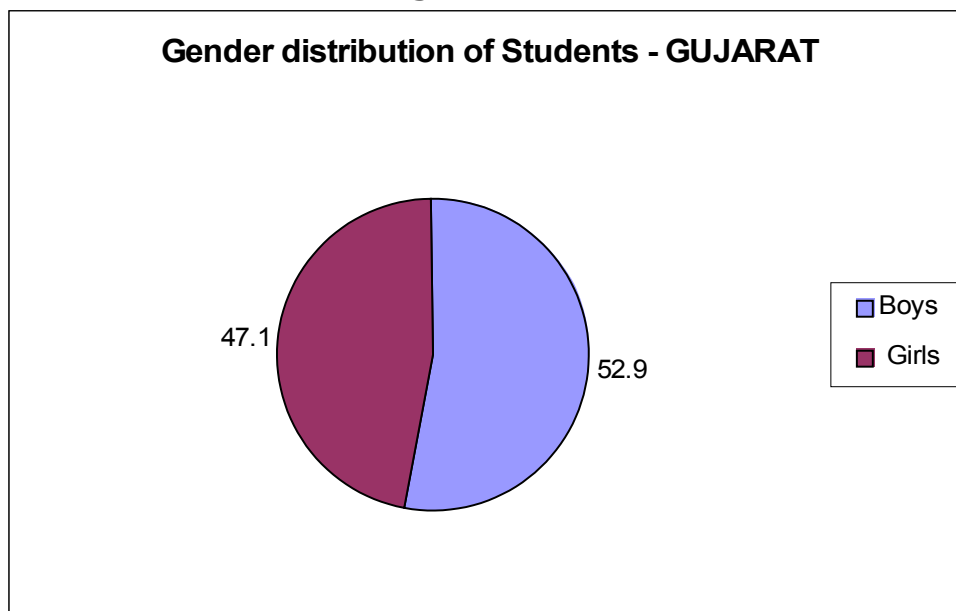




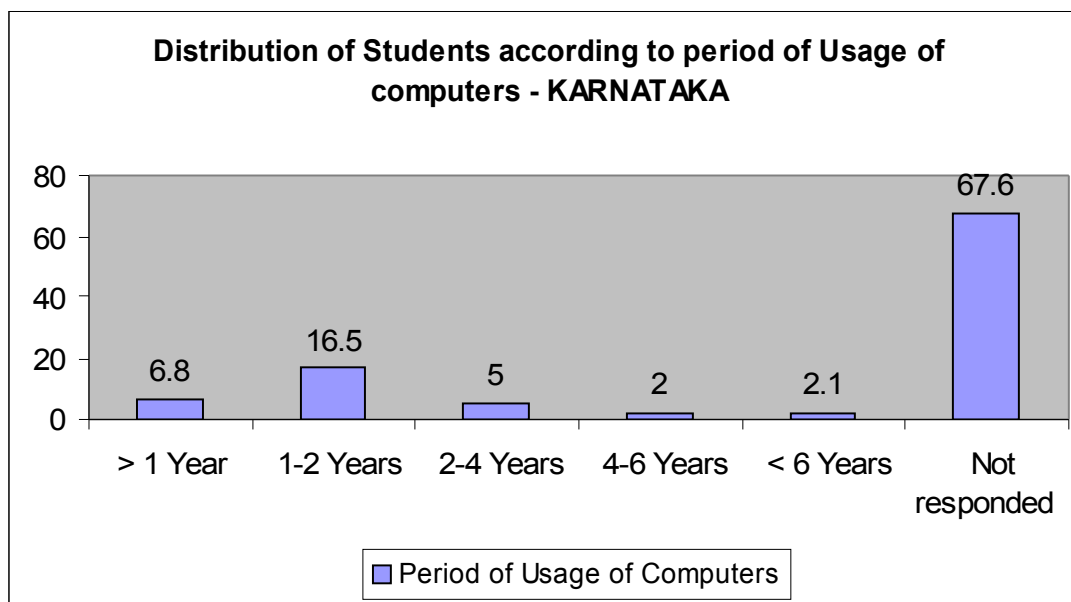
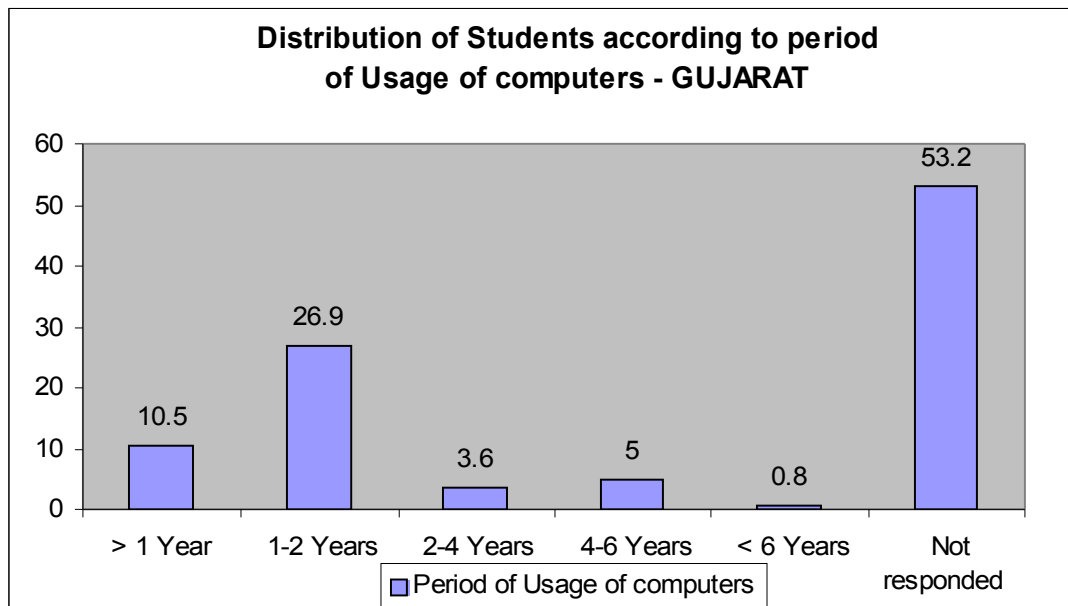
Table : S 10.1 depicted below shows the age distribution of the students surveyed. The maximum proportion of children was in the age group of 11-18 years. The proportion of children above 18 years was negligible.

**Table : S 10.1**  
**Age distribution of Students**

District/ State	Up to 5		5 – 10		11 – 18 Years		Above 18	
	N	%	N	%	N	%	N	%
Ahmedabad	581	15.7	1184	32.0	1926	52.1	4	0.1
Patan	2643	39.4	2964	44.2	1082	16.1	14	0.2
Surendranagar	196	3.0	1092	17.0	5135	79.8	10	0.2
<b>Gujarat</b>	<b>3420</b>	<b>20.3</b>	<b>5240</b>	<b>31.1</b>	<b>8143</b>	<b>48.4</b>	<b>28</b>	<b>0.2</b>
Bangalore	75	1.8	620	15.3	3364	82.8	2	0.0
Bellary	326	4.3	442	5.8	6837	89.8	9	0.1
Mandya	79	1.1	536	7.6	6400	91.1	10	0.1
<b>Karnataka</b>	<b>480</b>	<b>2.6</b>	<b>1598</b>	<b>8.5</b>	<b>16601</b>	<b>88.8</b>	<b>21</b>	<b>0.1</b>
<b>Total</b>	<b>3900</b>	<b>11.0</b>	<b>6838</b>	<b>19.2</b>	<b>24744</b>	<b>69.6</b>	<b>49</b>	<b>0.1</b>

Students were asked for how many years had they been using computers. The responses were of interest, as they depicted that use of ICT specifically Desktops was a recent phenomenon. Apart from the fact that there was low usage of computers as can be inferred from '**Annexure XIV**', wherein the number of students who did not respond to the queries was 60.8% of the total students surveyed, it was also a fact that use of computers was a recent phenomenon. In both the States, of the students who responded a significant proportion had started using computers within the last 1-2 years. The only exception was Ahmedabad where the largest group of students (19.9%) stated that they have been using computers for the last 4-6 years.

**Figure : S 11.1**



The fact that computers came to urban areas earlier can be inferred from the Table : S 11.2. While 2.5% of the urban children in Gujarat were familiar with computers 6 years earlier only 0.2% rural school students used computers at that time. This is true for Karnataka also where 3.1% of the urban school students surveyed knew computers 6 years back when only 0.9% of the rural students were familiar with them.

**Table : S 11.2**  
**Area orientation & Period of Usage of computers**

Number of Years using Computers	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Less than 1 Year	15.0	10.4	8.4	9.7	1.7	5.3
1 – 2 Years	26.8	35.8	25.7	20.1	14.7	14.2
2 – 4 Years	9.4	3.9	0.8	9.3	6.5	1.7
4 – 6 Years	14.4	2.7	0.9	4.2	3.4	0.2
Above 6 Years	2.5	0.1	0.2	3.1	5.4	0.9
Not Responded	31.8	47.2	64.0	53.7	68.3	77.7

This data was also analysed according to the type of school – Government or Private – the students attended. Table : S 11.3 depicts the data. It shows that many more private school students were acquainted with computers 4-6 years back in both the States. However, the largest proportions of students who have become familiar with these tools have been in the last 1-2 years. It is also clear that more private school students use computers than students going to Government schools. A possible reason for the same could be the fact that these schools are constrained by lack of resources.

**Table : S 11.3**  
**School Management & Period of Usage of computers**

Number of Years using Computers	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
	%	%	%	%
Less than 1 Year	6.0	14.9	5.6	8.8
1 – 2 Years	24.0	29.8	18.2	13.4
2 – 4 Years	1.2	6.0	2.1	10.6
4 – 6 Years	1.4	8.5	0.5	4.7
Above 6 Years	0.2	1.5	0.6	4.9
Not Responded	67.2	39.3	72.9	57.5

Table : S 11.4 depicts the period of computer usage in relation to the grade the students attended. As would be seen from the Table, hardly 0.5% of the primary school students were using computers in Gujarat 6 years back. Today, however the proportion is 41.1%. In Karnataka, 1.1% of the students of primary schools were using computers 6 years ago. The progress since then however, has been slow. In the secondary grades in Gujarat 1.1% of students were using computers 6 years back whereas the proportion now stands at 53%. In Karnataka too, there has been remarkable progress. While 1.7% of secondary students were using computers at that time now 42% students are using computers.

**Table : S 11.4  
Academic Level & Period of Usage**

Number of Years using Computers	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Less than 1 Year	9.7	11.3	3.7	8.6
1 – 2 Years	25.7	28.3	5.1	23.6
2 – 4 Years	2.5	4.7	5.7	4.6
4 – 6 Years	2.6	7.5	1.4	2.4
Above 6 Years	0.5	1.1	1.1	2.7
Not Responded	58.9	47.0	83.0	58.0

The Table below depicts the gender distribution of students using computers in the last few years. In Gujarat, more girls are using computers compared to boys and their numbers are also growing faster. This is apparent in Karnataka also, especially in the last 2 years.

**Table : S 11.5  
Gender Distribution of Students & Period of Usage**

Number of Years using Computers	Gujarat		Karnataka	
	Boys	Girls	Boys	Girls
Less than 1 Year	8.4	12.8	5.8	7.7
1 – 2 Years	24.0	30.3	16.1	16.9
2 – 4 Years	2.5	4.8	5.2	4.9
4 – 6 Years	3.0	7.2	1.5	2.5
Above 6 Years	0.9	0.8	2.1	2.2
Not Responded	61.2	44.2	69.3	65.8

The students surveyed were asked about their accessibility to various ICT tools both in school and outside. The results were interesting and though the two States are geographically far apart the results were not very dis-similar.

Talking about the accessibility to these tools outside school, in Gujarat the maximum access was to the Radio & Cassette Player (RCP), Television (TV) and Desktop Computer in that order. In Karnataka the results were the same. The least availability in Gujarat was of hand-held/PDA, Bubble jet Printer and then VHS and Digital Photocopiers. In Karnataka too, Bubble jet Printers, VHS/DVDs and LCD Projectors were scarce. Bubble jet Printers have not really been very popular in the country and the penetration of PDAs and DVDs, being newer technologies, has been slow. Dis aggregating the data according to the Districts, one sees that in both the capital cities of Ahmedabad and Bangalore it is the Desktop which is most easily accessible to students. In Patan (Gujarat) it is the TV whereas in Surendranagar (Gujarat) it is the RCP. Access to the RCP is also maximum for students of Bellary and Mandya in Karnataka. This has important implications for policy formulation and strategy for integrating technology into education.

**Table : S 12.1.1**  
**Distribution of Students Having Access to Various ICT Tools**

Access to ICT Tools	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Overhead Projector	22.2	17.1	10.0	15.5	25.5	14.2	17.2	17.8
Television	40.3	44.5	41.3	42.3	27.8	18.5	49.7	32.2
VCD	22.2	8.0	8.1	11.1	10.0	5.4	15.0	10.0
VHS	2.7	0.3	0.7	1.0	2.9	0.0	0.1	0.7
DVD	6.9	0.4	1.2	2.1	0.9	0.5	0.7	0.7
Video Camera	12.3	3.2	0.8	4.3	1.9	1.4	8.8	4.3
Photo Camera	23.2	14.5	4.0	12.4	12.2	7.2	15.6	11.4
Radio/Cassette Player	45.6	43.5	42.4	43.5	47.4	38.5	61.0	48.9
Digital Photocopier	2.6	0.6	0.6	1.0	0.8	0.1	2.6	1.2
Multimedia Projector	10.3	1.0	0.1	2.7	1.3	2.4	0.0	1.3
LCD Projector	6.6	1.0	2.8	2.9	2.5	0.4	0.1	0.7
Desktop Computer	54.2	20.5	16.5	26.4	47.7	26.9	23.2	30.0
Laptop Computer	14.0	1.7	0.9	4.1	2.1	3.5	0.9	2.2
Handheld/PDA	1.8	0.4	0.1	0.6	0.9	2.2	1.0	1.5
Colour Printer	20.4	7.5	1.8	8.2	8.0	2.9	4.2	4.5
Black & White Printer	24.6	9.8	3.3	10.6	23.3	17.0	16.1	18.0
Dot Matrix Printer	29.5	11.5	7.7	14.0	22.5	21.0	11.5	17.7
Laser Printer	9.9	3.3	0.6	3.7	3.1	0.7	1.2	1.4
Ink jet Printer	22.3	3.5	1.6	6.9	6.5	1.4	2.0	2.8
Bubble jet Printer	2.8	0.6	0.1	0.9	0.7	0.0	0.0	0.2
Scanner	13.0	4.3	0.9	4.9	3.9	0.5	1.0	1.4
CD Writer	15.7	3.2	1.2	5.2	4.4	2.0	0.1	1.8
Computer Speaker	50.1	15.8	6.9	19.9	36.5	19.8	17.8	22.7

The data was also analysed according to the rural and urban orientation of the students. In the urban areas of Gujarat, the accessibility was maximum for Desktops (49.6%), RCPs (46.3%) and Computer Speakers at 44.1%. Interestingly, 10.4% of the urban school students in Gujarat said that they had access to Laptops. In rural Gujarat, accessibility was maximum for TVs, RCPs and Desktops in that order. In urban Karnataka, it was the relatively older technology of RCPs which ruled at 47.4%. Next were Desktops and then TVs. While access to a Desktop was 39.4%, only 28.9% of the students had access to computer speakers. It could, therefore, be inferred that fewer computers in urban Karnataka were equipped with multi-media. In comparison to Gujarat, access to Laptops was also limited at 1.8% for the Karnataka urban school students. In rural areas again, access was maximum to RCPs, TVs and then the Desktop. It would, therefore, be seen that it is the relatively older technologies which have achieved larger penetration in the country. Effective pedagogical tools like various types of projectors are much less easily accessible.

**Table : S 12.2.1**  
**Access of Students to Various ICT Tools as determined by Area**

Access to ICT Tools	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
	%	%	%	%	%	%
Overhead Projector	21.8	17.6	12.3	18.2	11.8	18.3
Television	38.1	49.4	43.3	30.6	37.2	32.7
VCD	19.9	18.6	6.0	12.1	10.9	8.3
VHS	2.7	0.7	0.2	1.6	0.0	0.1
DVD	5.1	0.3	1.0	1.6	0.0	0.1
Video Camera	11.7	1.9	1.2	3.6	4.4	4.8
Photo Camera	24.5	8.0	7.4	15.4	6.0	9.3
Radio/Cassette Player	46.3	52.4	40.9	47.4	56.7	48.8
Digital Photocopier	2.6	0.5	0.4	1.6	0.3	1.0
Multimedia Projector	8.4	0.1	0.5	2.2	0.0	0.8
LCD Projector	4.6	0.6	2.5	1.5	0.1	0.3
Desktop Computer	49.6	45.7	12.8	39.4	33.8	22.5
Laptop Computer	10.4	0.9	1.7	1.8	0.0	2.9
Handheld/PDA	1.7	0.2	0.2	3.2	0.0	0.4
Colour Printer	18.2	8.4	3.5	9.8	0.7	1.2
Black & White Printer	23.9	6.6	5.0	22.9	21.6	13.9
Dot Matrix Printer	28.7	29.5	5.0	21.5	12.3	15.8

Laser Printer	10.2	0.4	1.2	2.4	0.0	0.8
Ink jet Printer	17.8	6.1	2.0	5.3	3.7	0.8
Bubble jet Printer	2.4	0.5	0.3	0.3	0.0	0.1
Scanner	11.9	3.7	1.8	2.8	2.2	0.3
CD Writer	13.2	8.0	1.1	2.3	4.1	1.0
Computer Speaker	44.1	30.9	7.1	28.9	23.4	18.0

An analysis of the data according to the type of school, Government or Private that the student goes to, is depicted in the Table below. It is widely held that children going to Private Schools and those attending Government Schools come from different socio-economic backgrounds. This is borne out by the fact that in Gujarat while only 10.4% of Government School students have access outside school to a Desktop Computer, four times that number (42.3%) of private school students have access to it outside school. Similarly, in Karnataka while only 25% of Government School students have access to a computer outside school, that number is 39.3% for Private School students.

In Gujarat, while the maximum availability of the various ICT Tools to Government School students was of the TV, RCP and the Desktop, for Private School students it was the RCP, the Desktop and the TV. In Karnataka, the maximum access of Government School students was to RCPs, TVs and Desktops and for Private School students it was RCPs, Desktops and TVs in that order. There was practically no access of Government School students in Karnataka to Bubble jet Printers, DVDs or LCD Projectors. Private School students in Karnataka were also unfamiliar with Bubble jet Printers, VHS and DVDs or LCD Projectors. For Gujarat Government School students, the least access was to DVDs, PDA, VHS, Multi-media Projectors and LCD Projectors. For Private School students in Gujarat, it was again the newer technologies of PDAs, Bubble jet Printers and VHS/Digital Photocopiers which were inaccessible. Incidentally, the VHS format is now obsolete.

**Table : S 12.3.1**  
**Students' Access to Various ICT Tools as determined by School Management**

Access to ICT Tools	Gujarat		Karnataka	
	Government or Public	Private	Government or Public	Private
Overhead Projector	5.0	26.0	19.4	14.7
Television	44.0	40.7	34.3	28.5
VCD	4.6	17.6	10.2	9.7
VHS	0.1	1.8	0.6	0.9
DVD	0.0	4.3	0.2	1.5
Video Camera	0.9	7.7	4.6	3.8
Photo Camera	6.1	18.7	9.5	15.0
Radio/Cassette Player	36.5	50.5	48.9	48.9
Digital Photocopier	0.3	1.8	0.9	1.7
Multimedia Projector	0.1	5.4	0.6	2.4
LCD Projector	0.3	5.5	0.3	1.5
Desktop Computer	10.4	42.3	25.0	39.3
Laptop Computer	1.3	6.9	2.2	2.2
Handheld/PDA	0.1	1.1	1.2	1.9
Colour Printer	3.5	12.8	0.9	11.2
Black & White Printer	4.0	17.2	17.0	20.0
Dot Matrix Printer	4.9	23.1	17.5	18.2
Laser Printer	0.7	6.7	0.7	2.6
Ink jet Printer	1.0	12.8	0.8	6.3
Bubble jet Printer	0.3	1.5	0.1	0.3
Scanner	1.7	8.0	1.0	2.3
CD Writer	0.9	9.5	0.5	4.2
Computer Speaker	7.2	32.6	20.9	25.9

Access of students to various ICT tools outside school was also analysed according to their grades. As depicted in the Table below it was generally observed that students going to primary classes were less resource-rich than those going to secondary classes. For example, only 12.8% of primary school students in Karnataka had access to a Desktop but the number of secondary school students who had such access was 40.7%. Similarly, as can be inferred from the data of accessibility to

Computer Speakers, Secondary School students had better access to newer technologies.

**Table : S 12.4.1**  
**Students' Access to Various ICT Tools according to Academic Level**

Access to ICT Tools	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Overhead Projector	10.8	20.6	2.6	27.1
Television	45.1	39.3	24.4	37.1
VCD	6.9	15.7	5.9	12.6
VHS	0.3	1.7	0.8	0.6
DVD	1.2	3.1	0.1	1.0
Video Camera	2.0	6.8	2.4	5.4
Photo Camera	7.7	17.5	6.3	14.6
Radio/Cassette Player	38.8	48.6	52.0	47.0
Digital Photocopier	0.6	1.5	0.2	1.8
Multimedia Projector	1.7	3.8	0.1	2.0
LCD Projector	1.2	4.8	0.5	0.8
Desktop Computer	16.8	36.7	12.8	40.7
Laptop Computer	2.6	5.7	1.4	2.7
Handheld/PDA	0.4	0.8	1.4	1.5
Colour Printer	6.0	10.5	3.1	5.3
Black & White Printer	6.3	15.2	4.9	26.1
Dot Matrix Printer	8.9	19.5	7.6	24.0
Laser Printer	2.7	4.8	0.1	2.2
Ink jet Printer	4.8	9.3	2.1	3.2
Bubble jet Printer	0.4	1.5	0.0	0.2
Scanner	2.0	8.0	0.6	2.0
CD Writer	3.1	7.5	0.0	2.8
Computer Speaker	13.9	26.5	7.6	32.0

Analysing the results according to the gender of the students it was found that surprisingly it were the girls who generally had better access to most ICT tools, whether it was Desktop Computers, Computer Speakers, Scanners or CD Writers.

**Table : S 12.5.1**  
**Gender Distribution of Students Having Access to Various ICT Tools**

Access to ICT Tools	Gujarat		Karnataka	
	Boys	Girls	Boys	Girls
Overhead Projector	9.5	22.3	16.7	18.8
Television	44.3	40.1	30.7	33.7
VCD	8.4	14.1	9.3	10.8
VHS	0.7	1.3	0.6	0.8
DVD	2.1	2.2	0.7	0.7
Video Camera	3.3	5.5	4.4	4.2
Photo Camera	8.2	17.2	10.7	12.2
Radio/ Cassette Player	42.1	45.1	48.6	49.1
Digital Photocopier	1.1	1.0	1.0	1.3
Multimedia Projector	2.0	3.6	1.6	0.9
LCD Projector	2.7	3.2	0.8	0.6
Desktop Computer	19.4	34.1	28.0	32.0
Laptop Computer	3.1	5.2	2.6	1.9
Handheld/PDA	0.4	0.8	1.5	1.4
Colour Printer	5.0	11.7	3.8	5.2
Black & White Printer	7.7	13.8	16.5	19.6
Dot Matrix Printer	10.5	18.0	17.1	18.4
Laser Printer	3.0	4.5	0.7	2.1
Ink jet Printer	5.1	9.0	2.3	3.2
Bubble jet Printer	1.2	0.6	0.2	0.2
Scanner	4.6	5.2	1.1	1.8
CD Writer	4.5	6.1	1.6	1.9
Computer Speaker	13.9	26.7	20.9	24.4

More important to the teaching learning process is the availability of ICT tools to students in school. As will be seen from the Table given below the access at school is much lower in general than that outside. While 42.3% of children in Gujarat had access to a TV outside school, the figure dropped to 24.8% at school. Similarly for RCPs, the figure was 43.5% and 25.6% while for Desktops, it was 26.4% and 18.4%. Similarly, in Karnataka while 32.2% of students had access to a TV outside school only 13.1% had access at school. For RCPs also the figure declined by 11% and Desktop Computers by 5.7%.

**Table : S 12.1.2**  
**Distribution of Students Using Various ICT Tools for School Work**

Access to ICT Tools	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendranagar	Total	Bangalore	Bellary	Mandya	Total
Overhead Projector	20.0	2.9	9.3	9.1	23.1	11.9	16.3	16.0
Television	33.9	5.4	39.8	24.8	20.2	10.9	11.4	13.1
VCD	15.5	1.7	7.4	6.9	7.2	3.2	5.0	4.8
VHS	2.4	0.3	0.5	0.8	2.6	0.0	0.0	0.6
DVD	6.2	0.1	1.2	1.9	0.5	0.5	0.2	0.4
Video Camera	9.9	0.7	0.8	2.8	1.4	0.1	1.1	0.8
Photo Camera	20.3	1.2	3.6	6.3	9.6	5.3	4.5	5.9
Radio/Cassette Player	37.8	3.7	41.4	25.6	33.1	30.0	49.2	37.9
Digital Photocopier	1.4	0.1	0.5	0.6	0.5	0.0	1.4	0.6
Multimedia Projector	9.2	0.1	0.1	2.1	0.3	1.8	0.0	0.8
LCD Projector	6.2	0.2	2.4	2.4	2.1	0.0	0.1	0.5
Desktop Computer	46.9	4.1	16.0	18.1	39.3	20.1	20.2	24.3
Laptop Computer	10.7	0.7	0.9	3.0	1.8	2.6	0.9	1.8
Handheld/PDA	1.1	0.1	0.1	0.3	0.5	1.9	0.8	1.2
Colour Printer	18.4	1.8	1.8	5.4	7.0	2.7	4.1	4.2
Black & White Printer	21.6	1.0	3.3	6.4	15.8	13.2	15.2	14.5
Dot Matrix Printer	25.0	1.9	7.5	9.2	19.0	16.4	11.4	15.1
Laser Printer	9.2	0.7	0.6	2.5	2.1	0.7	1.2	1.2
Ink jet Printer	18.3	0.6	1.5	4.8	6.3	1.4	2.0	2.7
Bubble jet Printer	2.1	0.1	0.1	0.6	0.4	0.0	0.0	0.1
Scanner	11.6	0.6	0.9	3.1	3.4	0.4	0.6	1.2
CD Writer	12.5	0.1	1.2	3.3	3.2	1.3	0.1	1.2
Computer Speaker	43.6	4.1	6.6	13.7	25.9	16.1	17.5	18.7

Analysing the same information according to the urban or rural orientation of the students gave the following Table. The access of urban school students in Gujarat was maximum to Desktops, Computer Speakers and RCPs, while for rural school students it was the TV, RCP and the Desktop Computer which were most accessible. However, the percentage of access was certainly lower in rural areas – 6.8% of rural school students in Gujarat had access to a Desktop during school time whereas 35.8% of urban school students had such an access. However, in urban areas also the availability of PDAs and Digital Photocopiers were minimal. In urban Karnataka also Digital Photocopiers and Bubble jet Printers were hardly accessible. In rural Karnataka, PDAs, Scanners, Bubble Jet Printers and VHS were found to be least accessible. One would also have to accept

that the need for PDAs and Scanners both in the present school curriculum and pedagogy is somewhat limited.

Urban Karnataka children had maximum access to RCPs, Desktops and Computer Speakers while in rural areas it is again the RCPs and Desktop Computers which were more easily accessible. Interestingly, there was more access of RCPs in the rural areas of Karnataka. However, access to Desktop Computers was less.

**Table : S 12.2.2**  
**Area orientation of Students Using Various ICT Tools for School Work**

Access to ICT Tools	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Overhead Projector	15.3	13.3	5.7	17.5	8.9	15.9
Television	26.2	36.8	22.4	16.0	12.6	11.1
VCD	12.2	13.4	3.5	6.2	2.2	4.1
VHS	2.2	0.5	0.2	1.4	0.0	0.0
DVD	4.2	0.3	1.0	0.9	0.0	0.1
Video Camera	8.5	1.7	0.2	1.0	0.1	0.6
Photo Camera	16.3	5.2	1.9	10.1	0.9	3.6
Radio/Cassette Player	29.1	37.7	22.2	35.3	52.0	37.6
Digital Photocopier	1.2	0.4	0.3	0.3	0.3	1.0
Multimedia Projector	6.3	0.1	0.4	1.4	0.0	0.5
LCD Projector	4.1	0.6	1.8	1.2	0.0	0.0
Desktop Computer	35.8	39.1	6.8	32.3	26.1	18.2
Laptop Computer	7.5	0.9	1.2	1.0	0.0	2.6
Handheld/PDA	1.0	0.2	0.0	3.0	0.0	0.0
Colour Printer	14.1	6.8	1.2	9.0	0.7	1.2
Black & White Printer	14.9	4.2	2.7	18.7	17.4	11.1
Dot Matrix Printer	20.0	25.0	1.9	18.2	12.2	13.2
Laser Printer	7.9	0.4	0.4	1.9	0.0	0.8
Ink jet Printer	12.6	5.5	1.2	5.1	3.7	0.8
Bubble jet Printer	1.7	0.4	0.0	0.2	0.0	0.0
Scanner	8.9	1.1	0.7	2.5	2.2	0.0
CD Writer	8.8	5.3	0.4	1.6	4.1	0.5
Computer Speaker	33.4	24.8	3.0	23.7	19.9	14.9

Compared to Private Schools there was noticeably less availability of ICT Tools in Government Schools. While 29.4% Private Schools in Gujarat and 32.2% of Private Schools in Karnataka had Desktop Computers, the figures for Government Schools were 6.7% in Gujarat and 20.1% in Karnataka. Interestingly, many more Desktop Computers were available in Karnataka in all schools compared to their counter-parts in Gujarat.

Karnataka Government Schools also had approximately three times the number of Computers compared to similar schools in Gujarat. As noticed earlier, the maximum availability in both Government and Private Schools in both the States remained that of older technologies like TVs, RCPs and Desktops. Government Schools in Karnataka also had a large number of Overhead projectors. Again, it was the relatively newer technologies of PDAs, DVDs, CD Writers and CD Projectors which were of limited access in both the States.

**Table : S 12.3.2**  
**Students Usage of Various ICT Tools for School Work as determined by School Management**

Access to ICT Tools	Gujarat		Karnataka	
	Government or Public	Private	Government or Public	Private
Overhead Projector	2.2	16.0	17.2	13.7
Television	25.8	23.8	13.9	11.6
VCD	4.0	9.8	4.9	4.5
VHS	0.1	1.5	0.5	0.8
DVD	0.0	3.8	0.2	0.7
Video Camera	0.3	5.2	0.5	1.2
Photo Camera	2.3	10.4	3.9	9.7
Radio/Cassette Player	19.3	31.8	37.9	37.8
Digital Photocopier	0.3	0.9	0.9	0.2
Multimedia Projector	0.1	4.1	0.4	1.5
LCD Projector	0.3	4.5	0.1	1.3
Desktop Computer	6.7	29.4	20.1	32.2
Laptop Computer	1.2	4.7	2.0	1.4
Handheld/PDA	0.0	0.6	0.8	1.8
Colour Printer	1.9	9.0	0.7	10.7
Black & White Printer	2.0	10.7	13.0	17.4
Dot Matrix Printer	3.0	15.3	14.9	15.4
Laser Printer	0.6	4.5	0.7	2.1
Ink jet Printer	0.5	9.2	0.8	6.2
Bubble jet Printer	0.0	1.1	0.0	0.3
Scanner	0.8	5.4	0.6	2.2
CD Writer	0.5	6.0	0.0	3.5
Computer Speaker	4.2	23.2	16.5	23.0

In Primary Schools in Gujarat there were more TVs compared to their secondary counter-parts. However, the number of Desktops in Secondary Schools were two and a half times more than primary schools. The number of Computer Speakers was also double in secondary schools in Gujarat. There were also 50% more RCPs in secondary

schools. In Karnataka while there were more RCPs for primary schools, the number of Desktops in secondary schools were three times that available in primary schools. The number of Computer Speakers were four times more. In general secondary school students had better access to ICT tools than their primary school counter-parts.

Comparing the primary school students of Gujarat with that of Karnataka, one finds that while availability of Desktop Computers is more or less the same, Gujarat's primary schools have more than two and a half times more TVs. However, the number of RCPs in Primary Schools in Karnataka is 200% more than in primary schools in Gujarat. Some of the primary schools in Gujarat have Multi-media projectors, however there are none in Karnataka.

More Secondary School Students in Karnataka have access to Desktops than their counter-parts in Gujarat. As the number of Computer Speakers is also larger it can be inferred that access to multi-media computers is more in Karnataka as are the number of RCPs. However, secondary school students in Gujarat have more access to TVs. There are more Multi-media LCD Projectors in Secondary Schools in Gujarat while there are more Overhead Projectors in Karnataka Secondary Schools. The reason possibly is because of availability of more resources with these schools.

**Table : S 12.4.2**  
**Academic level of Students Using Various ICT Tools for School Work**

Access to ICT Tools	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Overhead Projector	4.0	14.7	2.4	24.3
Television	26.2	23.3	9.0	15.7
VCD	3.1	11.0	3.0	5.8
VHS	0.2	1.5	0.8	0.5
DVD	1.1	2.8	0.0	0.6
Video Camera	1.1	4.5	0.9	0.7
Photo Camera	3.0	10.0	3.4	7.5
Radio/Cassette Player	20.3	31.3	43.6	34.4
Digital Photocopier	0.4	0.7	0.2	0.9
Multimedia Projector	1.3	3.0	0.0	1.3
LCD Projector	0.9	3.9	0.5	0.5
Desktop Computer	10.4	26.3	10.2	33.1
Laptop Computer	1.3	4.7	0.8	2.4
Handheld/PDA	0.2	0.5	1.3	1.1
Colour Printer	4.2	6.7	3.1	4.9
Black & White Printer	3.4	9.6	4.2	20.9
Dot Matrix Printer	5.8	12.8	5.9	20.8
Laser Printer	1.7	3.5	0.1	1.9
Ink jet Printer	3.1	6.8	2.0	3.1
Bubble jet Printer	0.2	1.0	0.0	0.2
Scanner	1.2	5.2	0.5	1.5
CD Writer	2.6	4.0	0.0	2.0
Computer Speaker	9.4	18.4	6.4	26.4

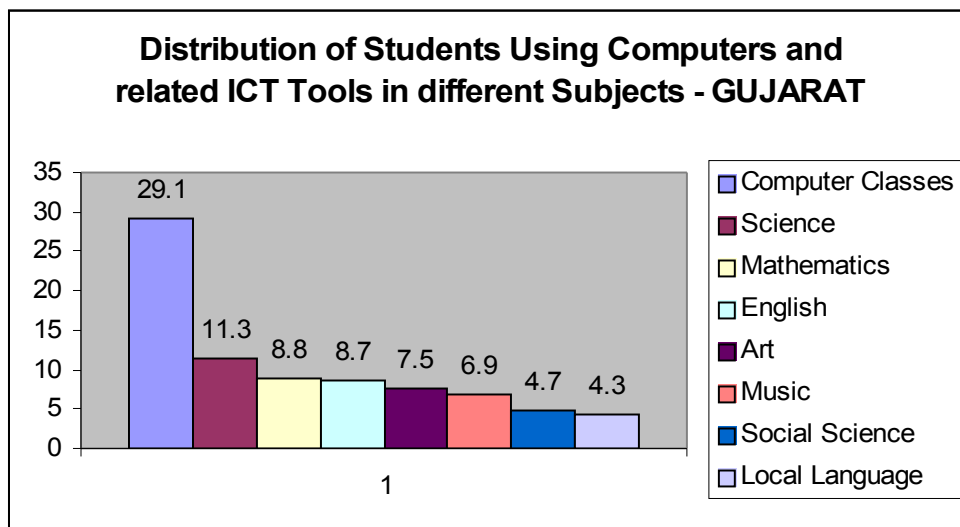
The access of girl students is much more to Desktop Computers in Gujarat. Data suggests that it is marginally more than boys for TVs, RCPs and even Lap-tops, CD Writers, Scanners and Computer Speakers. In Karnataka, the access of girl students to various ICT tools in schools is marginally more to TVs, RCPs, Desktops, Computer Speakers, Scanners and CD Writers. Comparing girls in Karnataka with their counterparts in Gujarat, one finds that RCPs, Desktop Computers and Computer Speakers are more accessible to girls in Karnataka. However, the availability of TVs to girls in Gujarat schools is more.

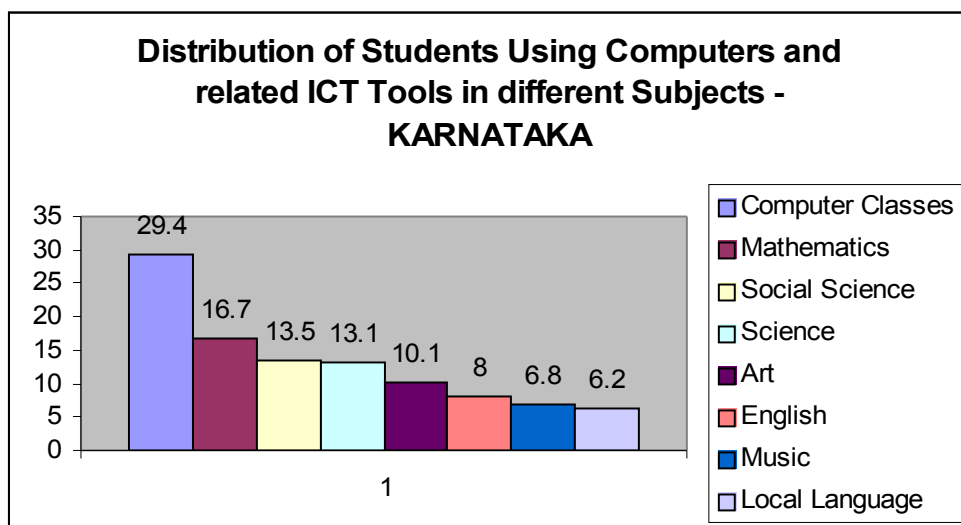
**Table : S 12.5.2**  
**Gender Distribution of Students Using Various ICT Tools for School Work**

Access to ICT Tools	Gujarat		Karnataka	
	Boys	Girls	Boys	Girls
Overhead Projector	7.2	11.3	14.4	17.5
Television	23.7	26.0	12.8	13.4
VCD	5.7	8.3	4.1	5.4
VHS	0.6	1.1	0.5	0.7
DVD	1.8	2.0	0.2	0.5
Video Camera	2.3	3.3	0.7	0.8
Photo Camera	5.2	7.6	5.2	6.6
Radio/Cassette Player	24.7	26.6	37.1	38.7
Digital Photocopier	0.7	0.5	0.4	0.9
Multimedia Projector	1.6	2.6	1.1	0.6
LCD Projector	2.4	2.3	0.5	0.5
Desktop Computer	14.4	22.2	23.3	25.4
Laptop Computer	2.4	3.6	2.0	1.5
Handheld/PDA	0.3	0.4	1.2	1.1
Colour Printer	3.9	7.2	3.6	4.7
Black & White Printer	5.3	7.5	13.7	15.4
Dot Matrix Printer	7.5	11.1	14.7	15.4
Laser Printer	2.5	2.6	0.6	1.8
Ink jet Printer	3.5	6.4	2.3	3.1
Bubble jet Printer	0.8	0.3	0.1	0.1
Scanner	2.7	3.7	0.8	1.5
CD Writer	2.4	4.2	1.1	1.4
Computer Speaker	9.5	18.4	17.7	19.8

Students were asked which subjects were computers and related ICT tools used for. In both the States, students used computers and related tools most for computer classes. In Karnataka, mathematics was next while in Gujarat it was Sciences. In both Bellary and Mandya, computers were used most in the computer classes and least for local languages. In Ahmedabad and Patan the results were the same. While in Surendranagar computers were used more for computer classes, their least usage was for music. Schools in India do not attach much importance to teaching of art and music. There was more broad-based usage of computers and related ICT tools for different subjects in Karnataka. There was also more usage for local languages in Karnataka as compared to Gujarat. Two conclusions follow – one, that computers and related ICT tools are primarily being used for teaching computers as a subject and is less integrated in teaching other subjects and two that availability of content for learning other subjects and specially local languages is limited.

**Figure : S 13.1**





Analysing the data according to the location of school in urban or rural areas does not affect the conclusions arrived at earlier. The data shows the same trend of maximum usage in learning computers as a subject and least usage for learning the regional language.

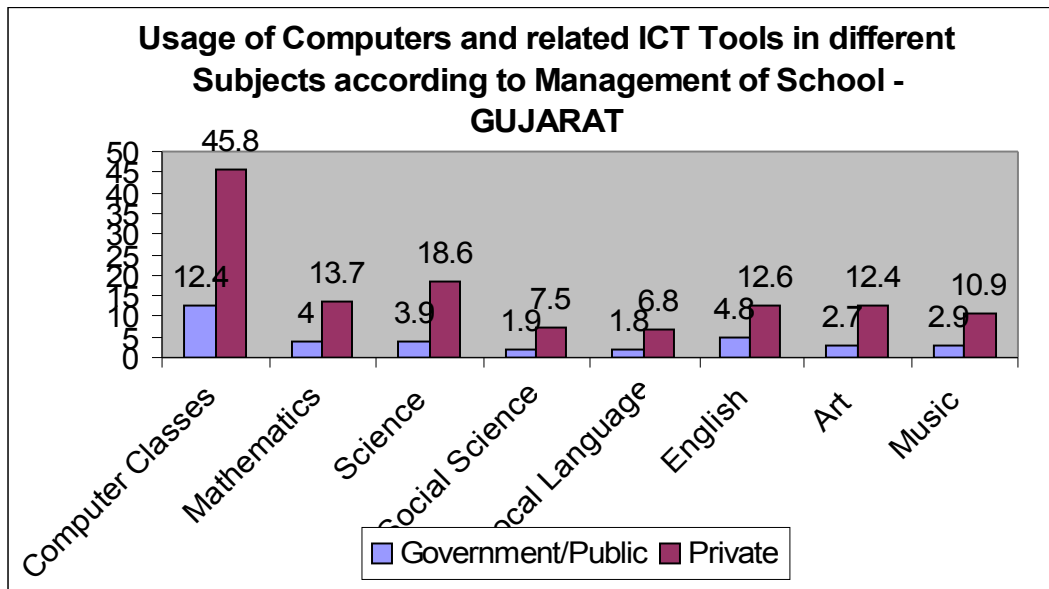
**Table : S 13.2**  
**Area orientation of Students Using Computers and related ICT Tools in different Subjects**

Students use computers in	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Computer Classes	57.1	48.6	13.3	40.5	31.0	21.0
Mathematics	19.7	8.4	3.8	15.7	13.4	17.9
Science	21.8	13.2	6.1	11.8	8.8	14.7
Social Science	10.6	8.0	1.5	12.1	11.9	14.7
Local Language	9.2	5.7	1.9	6.8	0.0	6.7
English	17.4	8.7	4.7	9.8	0.7	7.8
Art	19.8	7.0	1.9	12.4	6.6	8.9
Music	14.8	10.1	2.8	6.7	3.8	7.4

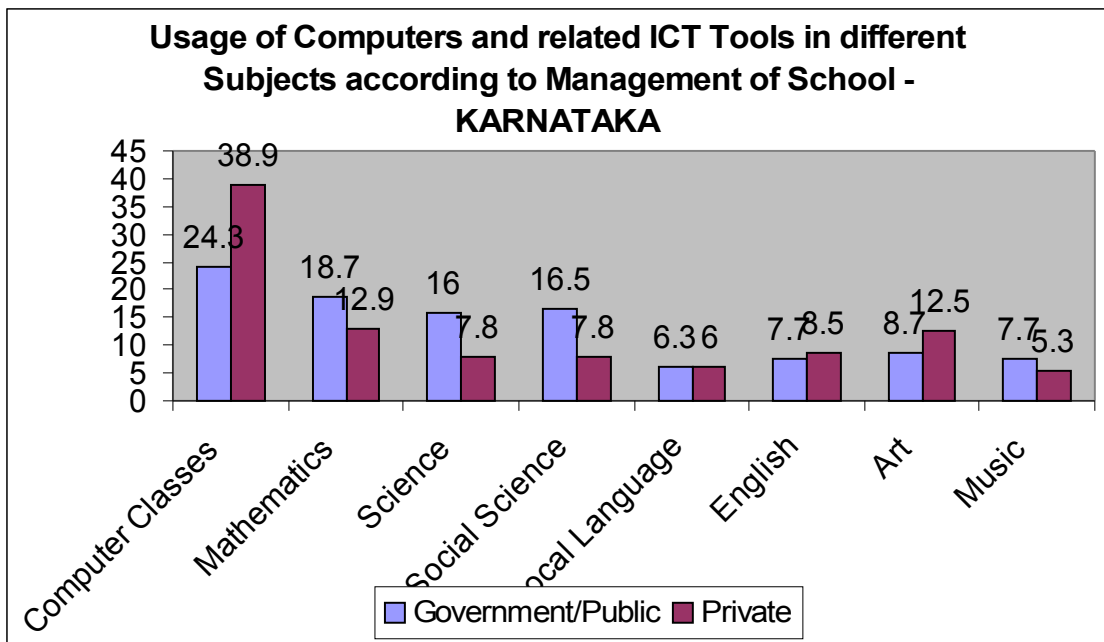
Comparing Government Schools with Private ones in the two States also shows the same trend. However, in Gujarat there is more broad-based usage in Private Schools while the same is true for Government Schools in Karnataka. Comparing Government School students in Karnataka with those of Gujarat it is found that twice the number use computers and related ICT tools for computer classes in Karnataka and four times the number for mathematics and science. Interestingly, more Private

Schools in Gujarat use computers for teaching the subject and also for mathematics and science.

**Figure : S 13.3**



**Figure : S 13.3**



The Table below compares the usage of computers in primary and secondary classes of Gujarat and Karnataka. As one would expect there is more utilization of computers and related ICT tools in secondary grades.

**Table : S 13.4**  
**Academic level of Students Using Computers and related ICT Tools in different Subjects**

Students use computers in	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Computer Classes	18.9	40.2	13.1	39.5
Mathematics	6.2	11.7	4.0	24.5
Science	7.1	15.7	2.7	19.5
Social Science	2.9	6.8	2.7	20.1
Local Language	3.5	5.2	2.4	8.6
English	6.8	10.8	3.1	11.0
Art	6.8	8.3	4.4	13.5
Music	6.0	7.9	2.9	9.2

Usage of computers for studying different subjects is more accessible to girl students of both Karnataka and Gujarat. This is in line with our earlier assessment that girl students have better access.

**Table : S 13.5**  
**Gender Distribution of Students Using Computers and related**  
**ICT Tools in different Subjects**

Students use computers in	Gujarat		Karnataka	
	Boys	Girls	Boys	Girls
Computer Classes	21.1	38.2	28.2	30.6
Mathematics	6.7	11.3	16.0	17.4
Science	7.3	15.7	12.2	14.0
Social Science	3.9	5.7	11.8	15.1
Local Language	3.1	5.7	6.0	6.4
English	6.5	11.3	6.9	9.0
Art	5.5	9.9	9.8	10.3
Music	5.2	8.9	6.5	7.2

Students were questioned on the level of expertise acquired by them in using ICT tools. These skills were divided into basic, intermediate and advanced. Less than 20% students surveyed in Gujarat assessed themselves as excellent or very good in the basic use of ICT tools. Only word processing got more than 20% responses. The situation was worse in Karnataka where in general only 5-10% assessed themselves excellent or very good at these simple skills. Again, only word processing was relatively better. As stated earlier, there was in general low level of expertise. In Gujarat 79.3% could not e-mail and 78.3% could not browse. In Karnataka, 87.3% could not e-mail and 89.5% could not browse! One important explanation for this lack of skills, specifically in the field of e-mailing, Internet Browsing, Chatting and Web-designing is the fact that the penetration of Internet is extremely low in the country.

**Table : S 14.1.1**  
**Distribution of Students having different levels of skills in Basic**  
**Computer Applications**

Basic Applications	Skills	GUJARAT				KARNATAKA			
		Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Word Processing	Excellent	9.1	0.8	2.0	3.1	4.0	4.3	2.3	3.5
	Very Good	8.4	39.4	2.3	18.4	9.2	4.4	7.6	6.7
	Good	12.7	8.6	5.1	8.1	13.3	6.3	6.0	7.7
	Fair	14.4	6.7	1.7	6.4	6.0	6.1	3.2	5.0
	No Capability	55.4	44.5	88.9	63.9	67.5	78.9	81.0	77.2
Spread Sheet	Excellent	5.1	0.1	1.4	1.7	2.3	1.0	0.8	1.2
	Very Good	7.1	41.3	0.5	18.2	3.5	3.5	0.1	2.2
	Good	8.5	1.5	3.4	3.7	6.1	3.9	0.1	3.0
	Fair	9.9	2.9	1.3	3.8	7.4	2.4	1.1	3.0
	No Capability	69.4	54.2	93.4	72.5	80.7	89.2	97.9	90.6
Presentation Tools	Excellent	6.5	0.4	0.9	1.9	7.9	3.4	3.1	4.3
	Very Good	4.3	40.4	1.0	17.4	7.1	4.2	7.0	5.9
	Good	9.5	3.7	4.9	5.5	7.9	6.2	3.9	5.7
	Fair	11.5	5.7	0.9	5.1	4.8	1.9	1.4	2.3
	No Capability	68.2	49.8	92.3	70.1	72.2	84.3	84.7	81.8
E-mailing	Excellent	1.9	0.0	0.0	0.5	1.4	1.5	1.9	1.6
	Very Good	2.7	39.6	0.2	16.4	4.9	0.1	2.6	2.1
	Good	4.3	0.1	1.3	1.5	4.4	2.8	4.9	3.9
	Fair	9.0	0.4	0.3	2.3	8.0	4.9	3.5	5.1
	No Capability	82.0	59.9	98.1	79.3	81.4	90.7	87.1	87.3
Internet Browsing	Excellent	2.6	0.0	0.2	0.7	1.6	1.4	1.5	1.5
	Very Good	2.1	39.5	0.4	16.3	3.4	0.0	3.1	1.9
	Good	3.5	0.2	1.6	1.5	4.6	3.5	4.1	4.0
	Fair	10.3	1.6	0.9	3.3	6.8	3.4	3.3	4.1
	No Capability	81.5	58.7	96.9	78.3	83.5	91.6	88.0	88.5
Graphics	Excellent	3.9	0.7	0.1	1.2	0.8	1.0	2.7	1.6
	Very Good	2.7	41.1	0.5	17.1	3.3	0.7	1.5	1.5
	Good	7.1	4.3	1.8	3.9	5.2	2.4	2.6	3.1
	Fair	5.4	1.0	0.5	1.8	3.3	3.9	1.1	2.7
	No Capability	80.9	52.9	97.2	76.0	87.3	92.0	92.2	91.1
WEB Designing	Excellent	2.5	0.1	0.9	0.9	1.2	1.0	0.7	0.9
	Very Good	2.7	40.8	0.7	17.1	2.6	0.0	0.1	0.6
	Good	6.5	1.6	1.2	2.5	3.2	0.2	2.0	1.5
	Fair	4.1	2.7	0.7	2.2	3.5	4.7	0.3	2.8
	No Capability	84.2	54.9	96.6	77.3	89.5	94.1	96.9	94.2

Chatting Platform	Excellent	1.5	0.0	0.7	0.6	1.5	1.0	0.4	0.9
	Very Good	0.4	40.3	0.2	16.2	2.0	0.0	0.3	0.5
	Good	1.6	0.1	0.4	0.5	3.0	1.4	0.2	1.3
	Fair	4.0	0.3	0.2	1.1	3.0	0.5	1.7	1.5
	No Capability	92.5	59.3	98.5	81.6	90.6	97.1	97.4	95.8

The data was compared between Government and Private Schools to assess the effectiveness of the different school systems. In Karnataka, while Private Schools students were better than their Government counter-parts in Word Processing, Spread Sheet, Graphics, Web Designing and Chatting, the Government School students were better at Presentation Tools, e-mailing and Internet Browsing. Similarly, while Private School students in Gujarat were better at Word Processing, Spread Sheets, Presentation Tools and Graphics, their Government counter-parts were better at e-mailing, Internet Browsing, Web Designing and Chatting. The results were therefore mixed.

**Table : S 14.1.3**  
**Students having different levels of skills in Basic Computer Applications as determined by School Management**

Basic Applications	Level of skills	Gujarat		Karnataka	
		Government/ Public	Private	Government / Public	Private
Word Processing	Excellent	0.5	5.6	3.4	3.7
	Very Good	21.8	15.0	6.8	6.4
	Good	3.2	13.1	6.6	9.6
	Fair	3.1	9.8	3.7	7.5
	No Capability	71.3	56.5	79.5	72.9
Spread Sheet	Excellent	0.1	3.3	1.1	1.4
	Very Good	22.1	14.3	1.5	3.6
	Good	1.5	6.0	2.1	4.5
	Fair	1.4	6.3	2.3	4.2
	No Capability	74.9	70.1	93.0	86.2
Presentation Tools	Excellent	0.1	3.7	4.7	3.4
	Very Good	22.3	12.5	7.4	3.1
	Good	1.5	9.4	5.6	6.0
	Fair	2.6	7.7	1.8	3.3
	No Capability	73.5	66.7	80.6	84.1
E-mailing	Excellent	0.0	0.9	1.3	2.1
	Very Good	21.6	11.3	2.6	1.1
	Good	0.8	2.2	4.9	2.1
	Fair	0.2	4.4	4.9	5.3
	No Capability	77.4	81.3	86.2	89.4

**Table : S 14.1.3 (Continued)**  
**Students having different levels of skills in Basic Computer Applications as determined by School Management**

Basic Applications	Level of skills	Gujarat		Karnataka	
		Government/ Public	Private	Government / Public	Private
Internet Browsing	Excellent	0.0	1.3	1.3	1.9
	Very Good	21.6	11.0	2.5	0.9
	Good	0.6	2.3	5.2	1.6
	Fair	1.5	5.0	4.4	3.5
	No Capability	76.3	80.4	86.5	92.1
Graphics	Excellent	0.0	2.3	1.5	1.8
	Very Good	21.9	12.4	1.6	1.5
	Good	0.3	7.6	2.8	3.6
	Fair	0.7	2.8	2.7	2.8
	No Capability	77.1	74.9	91.4	90.4
WEB Designing	Excellent	0.2	1.6	0.9	0.9
	Very Good	22.3	11.9	0.6	0.6
	Good	0.3	4.7	1.3	1.9
	Fair	0.1	4.4	2.9	2.7
	No Capability	77.2	77.4	94.3	93.9
Chatting Platform	Excellent	0.0	1.2	0.5	1.7
	Very Good	21.9	10.5	0.6	0.4
	Good	0.0	1.1	1.5	1.0
	Fair	0.0	2.1	1.3	1.8
	No Capability	78.0	85.1	96.1	95.2

The data was further analysed according to the location of the students (rural or urban) and also according to the grades (primary/secondary). In Karnataka students in urban areas had a better level of expertise in the use of these ICT tools. The results were more or less the same for Gujarat also. The resultant Table is given at **'Annexure-XV'**. In Karnataka more secondary school students had some level of expertise in the use of these tools than primary school students. This was broadly true for Gujarat also as given in the Table at **'Annexure XVI'**.

Analysing the level of expertise according to the gender of the students, one finds that while in Karnataka girls rated themselves as having more expertise than the boys, in Gujarat it was broadly the other way round. However, at most skills more girls rated themselves as excellent in Gujarat while broadly double the number of girls rated themselves as very good. The details are given in Table : S 14.1.5

**Table : S 14.1.5**  
**Gender Distribution of Students having different levels of skills in**  
**Basic Computer Applications**

Basic Appli-cations	Level of skills	GUJARAT		KARNATAKA	
		Boys	Girls	Boys	Girls
		%	%	%	%
Word Processing	Excellent	1.6	4.8	4.0	3.0
	Very Good	24.0	12.2	7.0	6.4
	Good	5.5	11.1	6.6	8.8
	Fair	3.8	9.4	4.1	5.9
	No Capability	65.1	62.5	78.4	76.0
Spread Sheet	Excellent	1.1	2.4	1.0	1.4
	Very Good	22.8	13.0	2.7	1.8
	Good	3.1	4.5	2.1	3.8
	Fair	2.3	5.6	2.9	3.0
	No Capability	70.6	74.6	91.3	90.0
Presentation Tools	Excellent	1.5	2.4	4.2	4.4
	Very Good	22.8	11.3	5.2	6.6
	Good	4.2	6.8	5.3	6.2
	Fair	3.3	7.2	2.3	2.3
	No Capability	68.1	72.3	83.1	80.5
E-mailing	Excellent	0.5	0.4	1.3	1.9
	Very Good	21.6	10.6	1.8	2.3
	Good	1.1	2.0	3.1	4.7
	Fair	1.9	2.6	4.6	5.5
	No Capability	74.9	84.3	89.1	85.6

Internet Browsing	Excellent	0.8	0.5	1.1	1.9
	Very Good	21.5	10.5	1.8	2.0
	Good	1.2	1.7	3.0	5.0
	Fair	2.4	4.3	4.3	4.0
	No Capability	74.2	83.0	89.8	87.1
Graphics	Excellent	0.8	1.6	1.4	1.8
	Very Good	21.6	12.1	1.2	1.8
	Good	1.8	6.4	2.5	3.7
	Fair	1.5	2.0	3.2	2.2
	No Capability	74.2	78.0	91.6	90.5

**Table : S 14.1.5 (Continued)**  
**Gender Distribution of Students having different levels of skills in**  
**Basic Computer Applications**

Basic Appli-cations	Level of skills	GUJARAT		KARNATAKA	
		Boys	Girls	Boys	Girls
		%	%	%	%
WEB Designing	Excellent	0.4	1.5	0.5	1.4
	Very Good	21.8	11.8	0.6	0.6
	Good	2.1	3.0	1.5	1.6
	Fair	1.9	2.6	2.9	2.7
	No Capability	73.9	81.1	94.5	93.8
Chatting Platform	Excellent	0.3	1.0	0.7	1.0
	Very Good	21.3	10.4	0.5	0.6
	Good	0.7	0.4	0.7	1.9
	Fair	1.3	0.8	1.4	1.5
	No Capability	76.4	87.4	96.6	95.0

An attempt was made to assess the intermediate level of skills which basically comprised of use of existing applications for learning both inside and outside the class. These consisted of Word Processing, Spread Sheets etc. in class room learning; use of various applications for doing assessments; e-mailing for tele-collaboration/on-line collaborating projects; use of internet resources to prepare home work, research, lessons or for collaborative school projects. The information has been tabulated according to the Districts, location (rural or urban), type of school (Government or Private) and gender at '**Annexure XVII, XVIII, XIX & XX**' respectively.

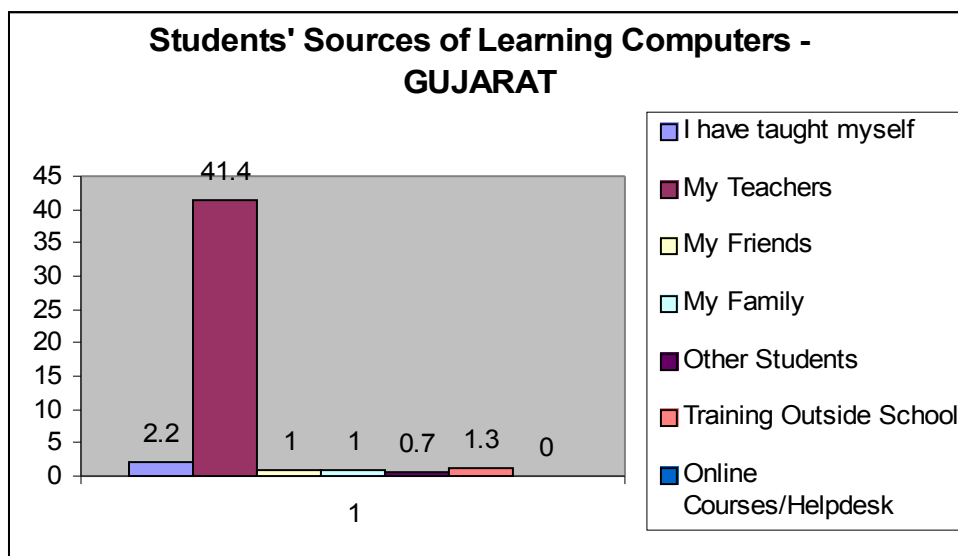
In general there is low level of expertise in the use of these skills in both the States whether in urban areas or rural areas, Private Schools or Government Schools or among boys or girls.

Students were also asked to assess their level of expertise in the advanced use of ICTs which related to creation and development of new applications, contents, learning materials etc. These consisted of use of statistical tools for developing

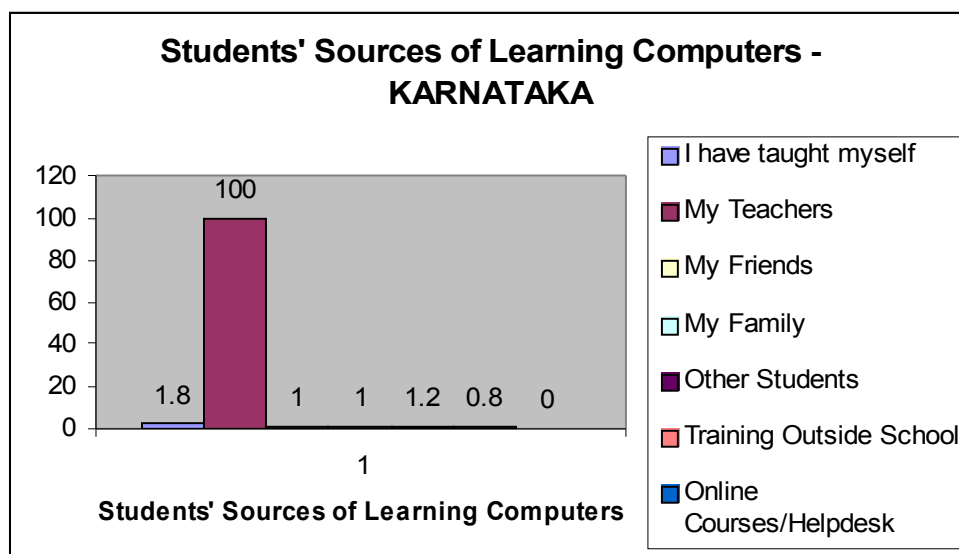
formulations and packages; programming; database development and management; advanced website designing; developing educational software, developing and operating E-learning or on-line learning platforms; setting-up and moderating discussion groups and chats; creating web based and ICT based multi-media materials. The responses were again tabulated according to the Districts, Rural and Urban areas Government or Private School and gender. There was hardly any expertise available with the students at any of these. The data was, therefore not analysed further as the sample size was too small and it would have given misleading results.

Students in the two States of the country were also asked about their source of learning computers. The options ranged from self-learning to learning from teachers, friends, family to on-line courses. As would be seen from the Table given below a vast majority in Gujarat stated that their teachers had taught them. In Karnataka all the respondents stated that they learnt computers from their teachers. Online courses did not get a single response, one of the reasons being the lack of Internet connectivity. In Gujarat their friends or family had taught some. However, this was not true of the Districts. In Bangalore too some students stated that their friends or family had taught them. The overall results point towards a teacher-oriented learning atmosphere.

**Figure : S 15.1**



**Figure : S 15.1**



Analysing the data according to the region the students belonged to, one found that there was hardly any difference between the rural and the urban areas as far as the biggest source of learning computers was concerned. Teachers in Gujarat had taught most and in Karnataka all respondents had learned computers from their teachers. The number of urban children who had taught themselves (5.6%) in Gujarat was much more than urban children in Karnataka (2.3%).

**Table : S 15.2**  
**Source of Learning Computers as determined by Area**

Sources of Learning	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
I have taught myself	5.6	3.7	0.3	2.3	1.0	1.5
My Teachers	60.6	52.6	31.0	100.0	100.0	100.0
My Friends	3.2	0.1	0.0	1.2	0.3	0.9
My Family	3.4	0.1	0.0	1.5	1.1	0.6
Other Students	1.8	0.3	0.2	1.0	0.6	1.4
Training Outside School	2.4	1.3	0.8	1.2	0.1	0.6
Online Courses/Helpdesk	0.1	0.0	0.0	0.1	0.1	0.0

One found no major difference in the trend when analysed according to the type of school – Government or Private – Primary or Secondary as would be apparent from the Table is given below.

**Table : S 15.3**  
**Students' Source of Learning Computers as determined by School Management**

Sources of Learning	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
I have taught myself	0.2	4.1	1.6	2.2
My Teachers	27.7	55.2	100.0	100.0
My Friends	0.2	1.7	1.0	0.9
My Family	0.2	1.8	0.4	2.1
Other Students	0.2	1.1	1.5	0.5
Training Outside School	0.3	2.3	0.9	0.5
Online Courses/Helpdesk	0.0	0.0	0.0	0.1

**Table : S 15.4**  
**Academic level of Students with their Source of Learning Computers**

Sources of Learning	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
I have taught myself	1.0	3.4	0.8	2.4
My Teachers	34.9	48.5	100.0	100.0
My Friends	0.4	1.6	0.1	1.5
My Family	0.7	1.4	1.0	1.1
Other Students	0.6	0.8	0.7	1.4
Training Outside School	0.7	2.0	0.1	1.2
Online Courses/Helpdesk	0.0	0.0	0.1	0.0

Students who had been taught computers were also analysed according to their gender. While there was no basic difference discerned, it was apparent that more girls had taught themselves in Gujarat and more boys had learnt computers on their own in Karnataka.

**Table : S 15.5**  
**Students Sources' of Learning Computers as determined by Gender**

Sources of Learning	Gujarat		Karnataka	
	Boys	Girls	Boys	Girls
I have taught myself	1.2	3.3	2.2	1.4
My Teachers	34.2	49.6	100.0	100.0
My Friends	0.7	1.3	1.0	0.9
My Family	0.5	1.6	1.1	0.9
Other Students	0.4	1.0	0.8	1.6
Training Outside School	0.9	1.8	0.2	1.3
Online Courses/Helpdesk	0.0	0.0	0.0	0.0

An important question, asked to the students, was the purpose and degree of use of ICT in schoolwork. The purposes ranged from informative and functional to creative and for communication. The frequency of use was classified as very often i.e. every day; often (twice or more a week); sometimes (a few times a month); rarely (once in several months or not at all). The information is given in Table : S 16.1 below.

**Table : S 16.1**  
**Distribution of students by purpose and frequency of using ICT in School Work**

Purpose	Frequency	GUJARAT				KARNATAKA			
		Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Informative - Find, Acquire and Use Information	Very Often	5.2	0.5	1.5	1.9	2.1	5.0	2.8	3.5
	Often	14.2	38.4	2.2	19.2	10.1	3.6	6.9	6.3
	Sometimes	7.5	5.3	0.5	4.0	9.7	3.9	2.3	4.6
	Rarely	6.3	8.3	0.8	5.0	4.1	2.2	1.7	2.4
	Not At All	66.9	47.5	94.9	69.9	73.9	85.3	86.3	83.2

Functional - Use and Manipulate existing Information	Very Often	0.2	0.2	0.2	0.2	3.2	3.5	2.1	2.9
	Often	13.7	35.4	2.6	18.1	8.0	7.6	5.0	6.7
	Sometimes	7.1	3.1	2.4	3.7	3.6	2.0	2.1	2.4
	Rarely	5.9	7.8	0.5	4.6	4.6	4.3	0.7	3.0
	Not At All	73.1	53.4	94.3	73.3	80.7	82.6	90.1	85.0
Creating - To compose, compile, produce new Information	Very Often	0.2	0.8	1.5	0.9	4.8	4.3	2.5	3.7
	Often	14.6	36.3	2.7	18.7	14.2	6.4	10.0	9.4
	Sometimes	14.7	5.9	1.2	6.0	6.2	4.0	2.0	3.7
	Rarely	4.8	7.5	0.4	4.2	4.9	1.7	0.7	2.0
	Not At All	65.7	49.6	94.3	70.2	70.0	83.7	84.8	81.1

Communication - To exchange and to transmit Information	Very Often	0.2	0.0	0.0	0.1	1.4	1.6	0.0	1.0
	Often	1.8	33.9	0.2	14.0	0.7	1.1	2.2	1.4
	Sometimes	4.4	1.7	0.3	1.8	4.9	2.1	3.1	3.1
	Rarely	5.4	3.5	0.6	2.8	5.0	4.3	2.4	3.7
	Not At All	88.2	60.8	99.0	81.4	88.0	91.0	92.3	90.8

It would be seen that there is a high percentage of students not using ICT at all. 90.8% of school students in Karnataka did not use ICT in their school work for communication i.e. to exchange and transmit information using E-mail and Internet. The corresponding figure was 81.4% in Gujarat. Students in Gujarat used ICT in their school work mostly for informative and creative purposes like writing papers, drawing, making power point presentations. Students in the Districts of Surendranagar in Gujarat use ICT the least. In Karnataka, more students used ICT for creative purposes than for any other. The District of Mandya utilized ICT tools the least.

Analysing the details according to location of the student one found that in both Gujarat and Karnataka urban areas were more frequent users of ICT tools in school work.

**Table : S 16.2**  
**Area orientation of Students by purpose and Frequency of Using**  
**ICT in School Work**

Purpose	Frequency	Gujarat			Karnataka		
		Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
		%	%	%	%	%	%
Informative - Find, Acquire and Use Information	Very Often	4.0	4.7	0.6	2.8	3.0	4.2
	Often	16.5	12.5	21.5	7.7	9.6	4.7
	Sometimes	7.9	3.8	2.1	7.2	3.8	2.7
	Rarely	6.8	9.2	3.6	2.2	3.4	2.5
	Not At All	64.9	69.8	72.2	80.1	80.3	85.9
Functional - Use and Manipulate existing Information	Very Often	0.2	1.1	0.1	3.2	0.0	3.2
	Often	12.1	15.1	21.3	9.7	0.1	5.5
	Sometimes	6.1	6.8	2.2	3.2	3.6	1.6
	Rarely	10.3	3.6	2.1	3.1	6.7	2.4
	Not At All	71.3	73.4	74.3	80.8	89.7	87.4

Creating - To compose, compile, produce new Information	Very Often	1.0	5.9	0.2	3.9	2.3	3.8
	Often	14.3	10.6	21.8	11.9	12.9	7.1
	Sometimes	11.6	6.4	3.4	5.3	0.8	2.9
	Rarely	7.2	0.9	3.2	3.4	3.6	0.7
	Not At All	65.8	76.2	71.4	75.5	80.4	85.4
Communication - To exchange and to transmit Information	Very Often	0.2	0.0	0.0	0.8	0.0	1.3
	Often	3.8	4.9	20.0	1.0	0.0	1.9
	Sometimes	3.3	0.1	1.3	3.4	5.3	2.5
	Rarely	4.1	1.7	2.3	4.1	6.7	3.0
	Not At All	88.6	93.2	76.4	90.7	88.0	91.4

There was only a marginal difference in the usage of ICT tools when assessed according to the type of school-Private or Government-that the student attended. In Gujarat Private School students used ICT marginally more than Government School students for all purposes except for communication. In Karnataka Private Schools used ICT marginally more than Government Schools for communication, creation and functional

purposes. Government School students used ICT more to find, acquire and use information.

**Table : S 16.3**  
**Distribution of students by purpose and frequency of using ICT in School work**  
**as determined by School Management**

<b>Purpose</b>	<b>Frequency</b>	<b>Gujarat</b>		<b>Karnataka</b>	
		<b>Government /Public</b>	<b>Private</b>	<b>Government/ Public</b>	<b>Private</b>
Informative - Find, Acquire and Use Information	Very Often	0.8	3.0	4.9	1.0
	Often	23.6	14.8	7.0	5.0
	Sometimes	0.7	7.2	3.9	5.8
	Rarely	3.5	6.5	1.6	4.0
	Not At All	71.3	68.4	82.7	84.1
Functional - Use and Manipulate existing Information	Very Often	0.2	0.3	3.6	1.7
	Often	23.7	12.5	5.6	8.8
	Sometimes	1.9	5.6	2.2	2.8
	Rarely	0.4	8.7	2.0	4.8
	Not At All	73.8	72.9	86.6	82.0

Creating - To compose, compile, produce new Information	Very Often	0.4	1.4	4.3	2.6
	Often	24.3	13.0	9.3	9.8
	Sometimes	2.6	9.4	3.5	4.0
	Rarely	2.3	6.0	1.2	3.6
	Not At All	70.3	70.1	81.7	80.1
Communication - To exchange and to transmit Information	Very Often	0.0	0.1	1.0	0.9
	Often	21.8	6.1	1.2	1.9
	Sometimes	1.4	2.2	3.6	2.1
	Rarely	1.5	4.1	3.0	5.0
	Not At All	75.3	87.5	91.2	90.1

An interesting gender stereotype was faced when the data was analysed. In Gujarat boys used ICT most often for informative purposes while in Karnataka girls used ICT most often in creating i.e. composing, compiling and producing new information. In general, however boys used ICT more in Gujarat and girls did so in Karnataka when compared to the opposite sex.

**Table : S 16.5**  
**Gender distribution of students by purpose and frequency of using**  
**ICT in School work**

<b>Purpose</b>	<b>Frequency</b>	<b>Gujarat</b>		<b>Karnataka</b>	
		<b>Boys</b>	<b>Girls</b>	<b>Boys</b>	<b>Girls</b>
Informative - Find, Acquire and Use Information	Very Often	2.0	1.9	3.3	3.8
	Often	25.0	12.7	5.3	7.2
	Sometimes	1.9	6.3	4.2	5.0
	Rarely	3.9	6.2	1.5	3.4
	Not At All	67.3	72.8	85.7	80.7
Functional - Use and Manipulate existing Information	Very Often	0.1	0.3	2.2	3.7
	Often	24.2	11.2	7.0	6.4
	Sometimes	2.3	5.3	1.9	2.8
	Rarely	2.3	7.2	3.0	3.0
	Not At All	71.0	75.9	85.9	84.1

Creating - To compose, compile, produce new Information	Very Often	0.9	0.9	3.3	4.1
	Often	24.2	12.4	8.9	10.0
	Sometimes	3.4	8.9	4.0	3.4
	Rarely	2.0	6.7	2.0	2.0
	Not At All	69.5	71.0	81.8	80.5
Communication - To exchange and to transmit Information	Very Often	0.1	0.1	1.1	0.8
	Often	21.1	5.9	0.9	1.9
	Sometimes	0.8	2.9	2.3	3.8
	Rarely	2.3	3.3	3.3	4.1
	Not At All	75.7	87.9	92.3	89.4

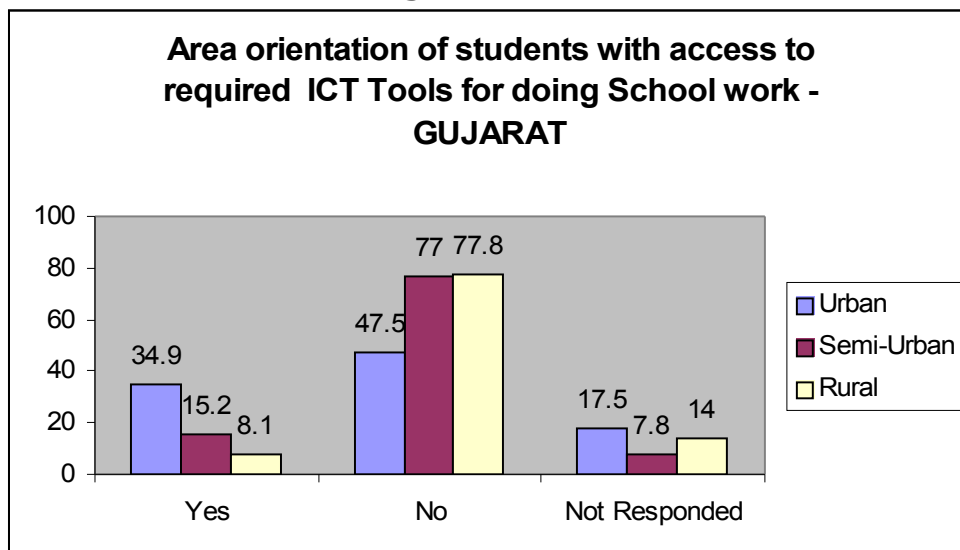
The students from the two States were also questioned about the access to required ICT tools and facilities for doing class work. Only 16.5% students in Gujarat and 20.6% in Karnataka responded that they have access to the required ICT tools for doing class work. The maximum affirmative responses were from Ahmedabad (41.5%) in Gujarat and the least at 9.1% from Surendranagar. Access it seemed was more evenly distributed between the capital and the districts in Karnataka.

**Table : S 17.1**  
**Distribution of students with access to required ICT Tools for doing School work**

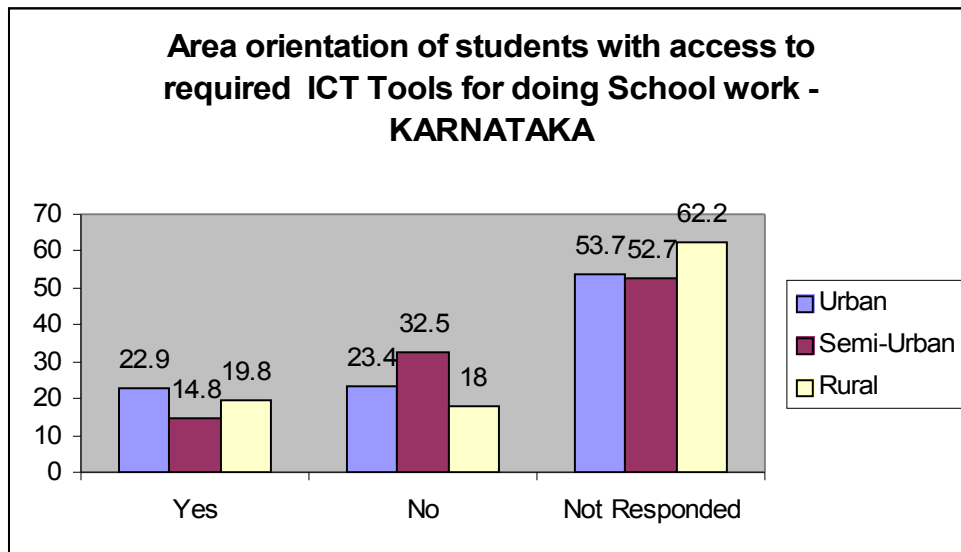
Access	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Yes	41.5	9.8	9.1	16.5	22.7	21.5	18.3	20.6
No	39.0	80.8	73.9	69.0	36.8	19.1	14.7	21.3
Not Responded	19.5	9.3	17.0	14.5	40.5	59.3	67.0	58.1

This was also analysed according to the location of the school. In Gujarat access seemed to be directly co-related with the level of urbanization. Maximum access was in urban areas at 34.9%, which declined to 15.2% in semi-urban areas and further to 8.1% in rural areas. In Karnataka while access was most easy in urban areas the sharp divide seen in Gujarat was missing.

**Figure : S 17.2**



**Figure : S 17.2**



In Gujarat access to require ICT tools was maximum for Private School students at 28.3%. Only 4.7% of Government School children had such facilities. In Karnataka fortunately there was no digital divide between the Private School students and the Government School students.

**Table : S 17.3**  
**School Management & students with access to required ICT Tools for doing Schoolwork**

Access	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
Yes	4.7	28.3	20.6	20.5
No	76.2	61.8	19.2	25.3
Not Responded	19.1	9.9	60.2	54.2

As would be expected Secondary School students had better access to ICT tools in both the States.

**Table : S 17.4**  
**Academic level of Students with access to required**  
**ICT Tools for doing School work**

Access	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Yes	13.5	19.8	8.2	28.2
No	70.1	67.8	17.9	23.4
Not Responded	16.4	12.4	73.9	48.3

Analysing the data according to the gender of the students it was found that girl students in Gujarat had a distinctly better access to ICT tools. While this was also true for Karnataka the difference was not as pronounced.

**Table : S 17.5**  
**Gender Distribution of Students with access to required**  
**ICT Tools for Doing School work**

Access	Gujarat		Karnataka	
	Boys	Girls	Boys	Girls
Yes	12.4	21.1	19.0	22.2
No	69.7	68.2	20.8	21.8
Not Responded	17.9	10.7	60.2	56.0

The location of computers is an important determinant of access to technology by the students. If Desktops are confined to the office or TVs to the residence of the Principal, these technologies would have no impact on the teaching-learning process. An assessment was made of the location of computers in schools. In Gujarat, location of computers in classrooms and in a computer laboratory was evenly distributed. In Karnataka computers were pre-dominantly located in Laboratories. Some were housed in the library also. The maximum number of computers in laboratories were in Bangalore. None of the respondents ticked both classroom and the laboratory as the location of computers in Gujarat.

**Table : S 18.1  
Distribution of Location of Computers**

Location	Gujarat				Karnataka			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Classroom	7.6	1.2	3.8	3.6	2.4	0.1	0.1	0.6
Computer Laboratory	16.6	0.0	0.0	3.7	42.9	27.2	18.3	27.2
Both Classroom & Laboratory	0.0	0.0	0.0	0.0	0.2	0.2	2.7	1.1
Library	0.1	0.0	0.0	0.0	0.1	0.5	0.4	0.4
Do not use Computers	1.1	0.0	0.0	0.2	4.0	2.7	3.2	3.2

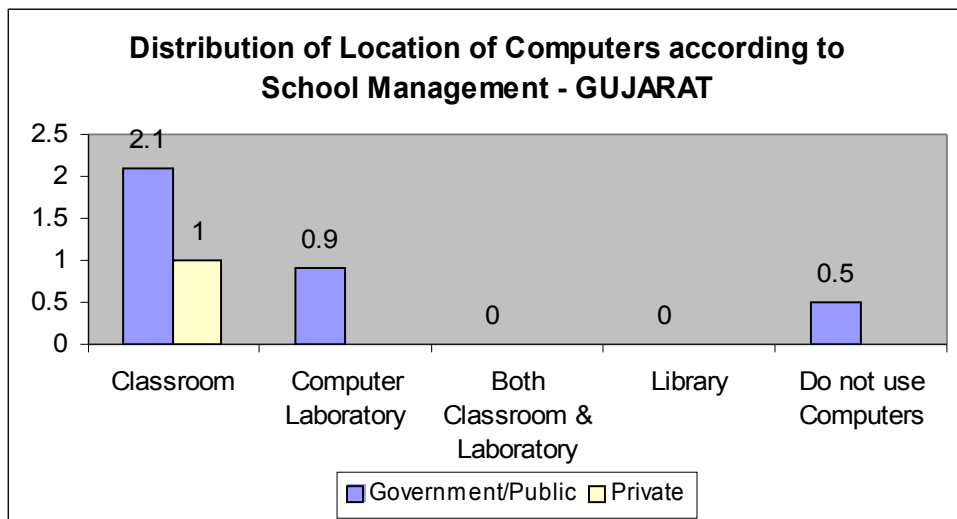
Analysing the results according to the geographical location of the school it was found that computers were located in classrooms only in all the rural schools surveyed in Gujarat. For most of the urban schools, the preferred location was the computer laboratory. In Karnataka, however most rural schools have separate computer laboratories and none of the computers were located in the classrooms. As in Gujarat most urban-based schools in Karnataka also had computers located in separate laboratories. The highest percentage of both classroom and laboratory location in the survey was in urban Karnataka.

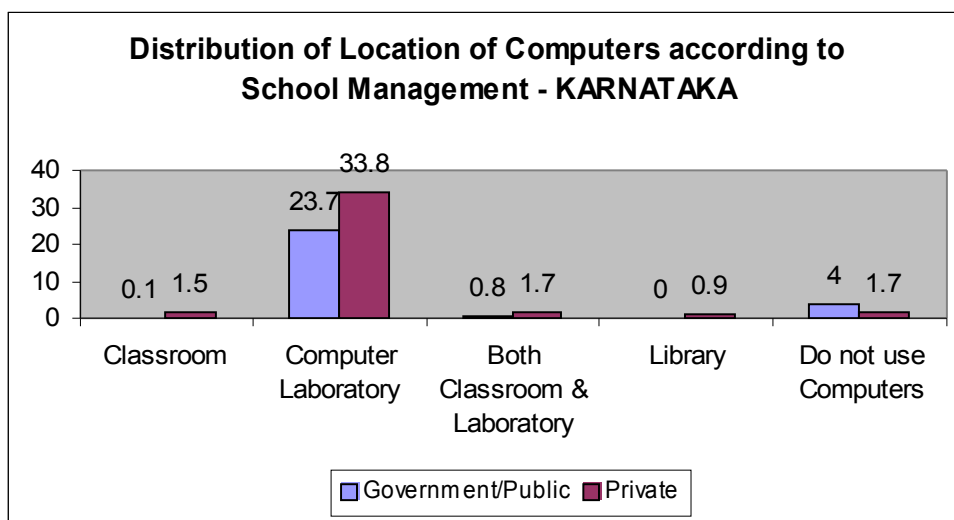
**Table : S 18.2**  
**Area orientation of Distribution of Location of Computers**

Location	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Classroom	5.8	4.6	2.4	1.4	0.2	0.0
Computer Laboratory	12.6	0.1	0.0	35.5	29.2	20.9
Both Classroom & Laboratory	0.0	0.0	0.0	2.3	0.0	0.5
Library	0.0	0.0	0.0	0.4	0.1	0.4
Do not use Computers	0.8	0.2	0.2	2.9	0.5	3.8

An interesting co-relation was found between the type of school & the location of computers in Gujarat. Most of the Government Schools had computers located in their classrooms while most private schools had separate labs for the same. In Karnataka, practically all Government Schools had Computer Laboratories and this was true for Private Schools also.

**Figure : S 18.3**





In primary schools in Gujarat, most of the computers were housed in separate computer laboratories while secondary schools had them pre-dominantly in the classrooms. There was no such distinction in Karnataka where most of the computers were in labs.

**Table : S 18.4**  
**Academic level & Distribution of Location of Computers**

Location	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Classroom	2.7	4.6	1.0	0.3
Computer Laboratory	6.8	0.2	11.9	36.7
Both Classroom & Laboratory	0.0	0.0	0.3	1.7
Library	0.0	0.0	0.3	0.4
Do not use Computers	0.5	0.0	2.8	3.4

When asked about their favourite activities for which students used computers, the most popular in Gujarat were playing games at number one, drawing and painting at number two & writing papers at number three. In Karnataka these were drawing and painting then playing games and lastly making Power Point presentations. The popularity of these activities was consistent in all the three districts of Gujarat. For Karnataka too, these ranking were same for Bangalore and Bellary but different for Mandya where

students most liked to play games on the computers. It would be seen from the Table given below that the activities dependent on Internet access ranked low in both States. These included Chatting, down loading Music, Surfing the Net or E-mailing.

**Table : S 19.1**  
**Distribution of students' favourite activities using computers**

Favorite Activities	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Find & Research Information	17.3	13.2	2.1	9.9	10.7	6.2	8.7	8.1
E-mail	8.6	0.9	0.3	2.4	13.0	5.0	8.4	8.0
Chat	7.3	1.5	0.9	2.6	11.6	2.6	2.7	4.6
Download music	15.1	3.9	4.1	6.4	12.0	3.5	6.2	6.3
Play Games	60.4	31.2	15.4	31.6	41.0	19.5	21.8	25.0
Surf the Internet	5.4	0.2	1.4	1.8	8.5	3.4	8.1	6.3
Use Educational Software	24.5	12.3	5.4	12.3	17.1	12.0	10.4	12.5
Writing Papers	25.4	17.1	6.2	14.7	11.4	8.5	9.5	9.5
Writing Computer Programs	11.2	13.2	4.2	9.3	8.8	6.4	2.9	5.6
Draw and Paint	58.6	29.5	13.4	29.8	41.3	25.0	20.5	26.8
Make Presentation Using Power Point	20.8	7.6	4.2	9.2	21.1	12.3	14.0	14.8

Both urban and rural students in Gujarat liked to play games as their most favoured activity, drawing and painting came next. In Karnataka these rankings were reversed.

**Table : S 19.2**  
**Students' favourite activities using computers as determined by Area**

Favorite Activities	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Find & Research Information	18.3	6.0	6.5	8.7	13.8	6.9
E-mail	6.8	0.9	0.5	9.5	6.5	7.1
Chat	5.7	0.7	1.3	6.0	6.8	3.2
Download music	12.7	11.2	2.8	8.1	3.0	5.6
Play Games	57.6	45.9	17.4	31.8	26.8	19.8
Surf the Internet	3.7	2.4	0.9	5.3	12.7	6.0
Use Educational Software	22.5	14.0	7.4	13.8	15.9	11.0
Writing Papers	24.7	11.8	10.5	8.5	13.1	9.7
Writing Computer Programs	13.4	13.5	6.8	5.9	4.9	5.5
Draw and Paint	56.7	43.5	15.2	36.1	25.8	20.2
Make Presentation Using Power Point	19.4	16.5	3.4	15.4	15.0	14.4

Government School students liked to draw and paint most and play games next. It was the other way round for Private School students in Gujarat where 49.8% ranked playing games as their favourite activity using computers. In Karnataka also there was similarity in the choices with Gujarat where most of the Government School students liked to draw and paint most and play games next. The favoured activities of Private School students was the reverse to that of Government School students in Karnataka but same as that of private school students in Gujarat.

**Table : S 19.3**  
**Students' Favourite Activities Using Computers as determined by School Management**

Favorite Activities	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
Find & Research Information	5.5	14.2	8.1	8.2
E-mail	0.6	4.1	8.8	6.6
Chat	1.6	3.5	3.5	6.7
Download music	2.5	10.4	5.4	8.2
Play Games	13.3	49.8	20.1	34.3
Surf the Internet	1.1	2.6	8.0	3.1
Use Educational Software	6.5	18.2	13.3	11.0
Writing Papers	8.7	20.8	10.6	7.4
Writing Computer Programs	5.7	12.8	4.6	7.4
Draw and Paint	14.0	45.5	23.4	33.3
Make Presentation Using Power Point	2.3	16.1	17.1	10.7

It was these two activities which retained their popularity even when the data was analysed according to the grade of the students, both in Gujarat and in Karnataka.

**Table : S 19.4**  
**Favourite activities as determined by Academic Level of Students**

Favorite Activities	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Find & Research Information	8.1	11.8	1.0	12.5
E-mail	1.1	3.7	1.4	12.1
Chat	0.6	4.7	1.3	6.6
Download music	3.6	9.5	2.1	9.0
Play Games	21.4	42.6	11.6	33.3
Surf the Internet	1.0	2.7	1.0	9.5
Use Educational Software	8.3	16.7	4.6	17.3
Writing Papers	10.7	19.1	4.2	12.8
Writing Computer Programs	5.7	13.2	3.0	7.2
Draw and Paint	20.1	40.2	12.0	36.0
Make Presentation Using Power Point	5.4	13.3	3.4	21.9

There was no gender difference in the ranking of activities between girls and boys both in Karnataka and in Gujarat. In Gujarat both ranked playing games as the most favourite activity. However, the number of responding girls was much higher. In Karnataka drawing and painting was the favourite activity for both girls and boys.

**Table : S 19.5**  
**Students favourite activities using computers according to Gender**

Favorite Activities	Gujarat		Karnataka	
	Boys	Girls	Boys	Girls
Find & Research Information	5.9	14.4	6.7	9.6
E-mail	1.9	2.9	7.4	8.6
Chat	2.3	2.8	3.6	5.6
Download music	4.3	8.8	6.5	6.2
Play Games	22.7	41.6	24.3	25.8
Surf the Internet	1.6	2.1	5.8	6.7
Use Educational Software	8.6	16.6	11.5	13.5
Writing Papers	8.6	21.6	8.7	10.3
Writing Computer Programs	4.3	15.0	6.1	5.1
Draw and Paint	20.6	40.0	25.6	28.1
Make Presentation Using Power Point	6.0	12.8	14.3	15.4

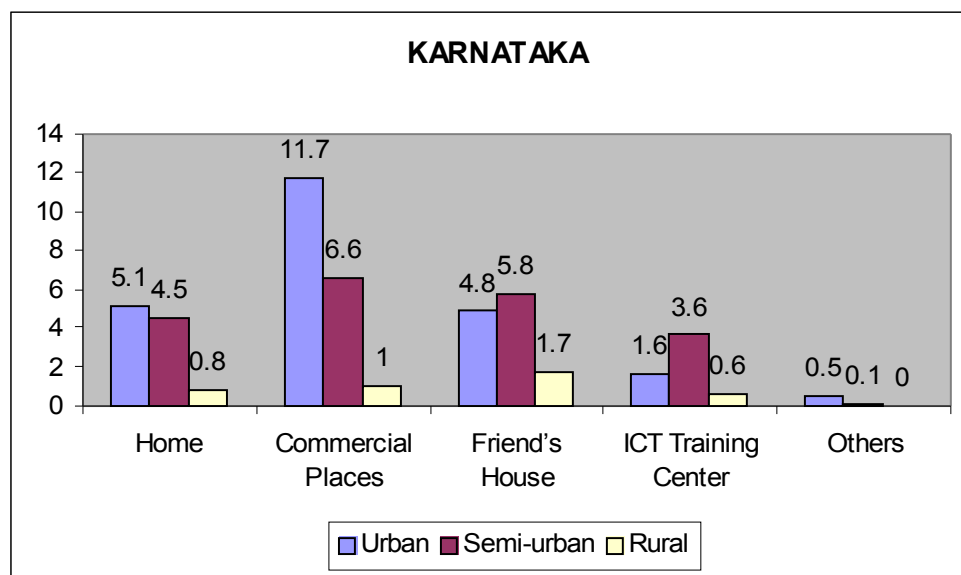
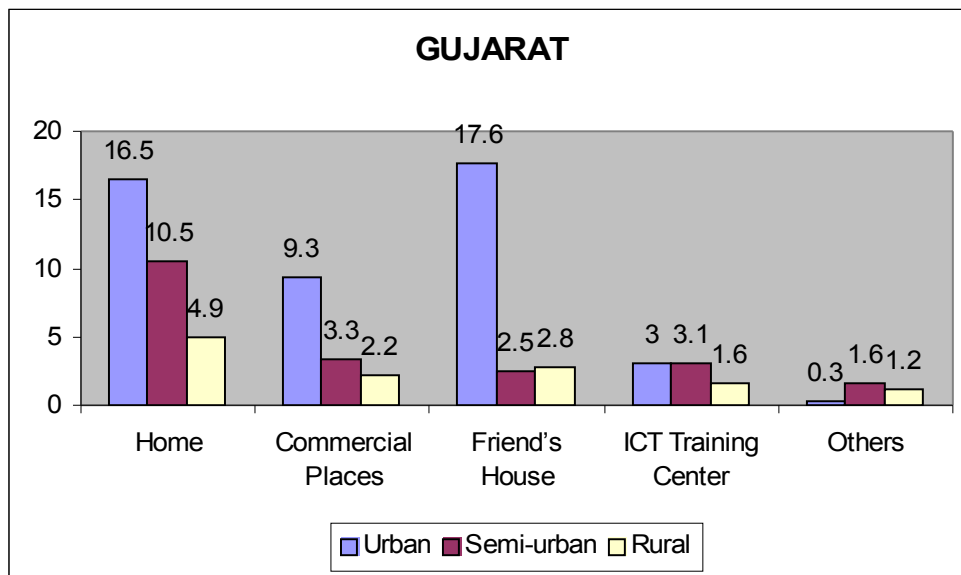
Apart from the school there are very few places in India where students may have access to and use of ICT tools & facilities. In Gujarat, students' own homes and friend's house ranked first and second in this respect. In Karnataka, it was commercial places, which provided most access outside schools and then their friend's house.

**Table : S 21.1**  
**Distribution of places other than school where students have access to ICT Tools**

Places	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Home	10.0	15.7	0.9	8.8	8.1	2.3	0.2	2.8
Commercial Places	10.5	4.3	0.9	4.3	21.3	2.3	0.0	5.6
Friend's House	18.8	6.7	0.6	7.0	7.5	3.6	0.3	3.2
ICT Training Center	3.8	0.9	2.5	2.1	1.6	2.2	0.0	1.2
Others	0.3	0.6	1.7	1.0	0.7	0.1	0.0	0.2

In urban areas in Gujarat student's access to ICT tools was most possible at a friend's house and then at their own home. In urban Karnataka commercial places came first. In rural Gujarat access to these devices outside school was mostly at home while in rural Karnataka it was at a friend's house.

**Figure S 21.2**  
**Area orientation of Distribution of places other than school where Students have access to ICT Tools**



Access of Government School students to ICT tools outside school was in general low. The access of Private School students to such devices was comparably better and pre-dominantly at home which implied a better socio-economic condition. This was true for both Gujarat and Karnataka.

**Table : S 21.3**  
**Distribution of places other than school where students have access to ICT Tools as determined by School Management**

Places	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
Home	2.0	15.5	1.3	5.7
Commercial Places	1.3	7.4	3.3	9.9
Friend's House	1.3	12.7	1.3	6.7
ICT Training Center	1.8	2.4	0.9	1.9
Others	0.5	1.4	0.2	0.2

Secondary School students as would be expected had better access compared to Primary School students in Gujarat. This was true for the State of Karnataka also.

**Table : S 21.4**  
**Distribution of places other than school where Students have access to ICT Tools as determined by Academic level**

Places	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Home	5.8	12.0	2.3	3.1
Commercial Places	2.4	6.5	2.6	7.4
Friend's House	5.2	9.0	1.0	4.6
ICT Training Center	1.7	2.6	0.2	1.9
Others	0.5	1.5	0.0	0.3

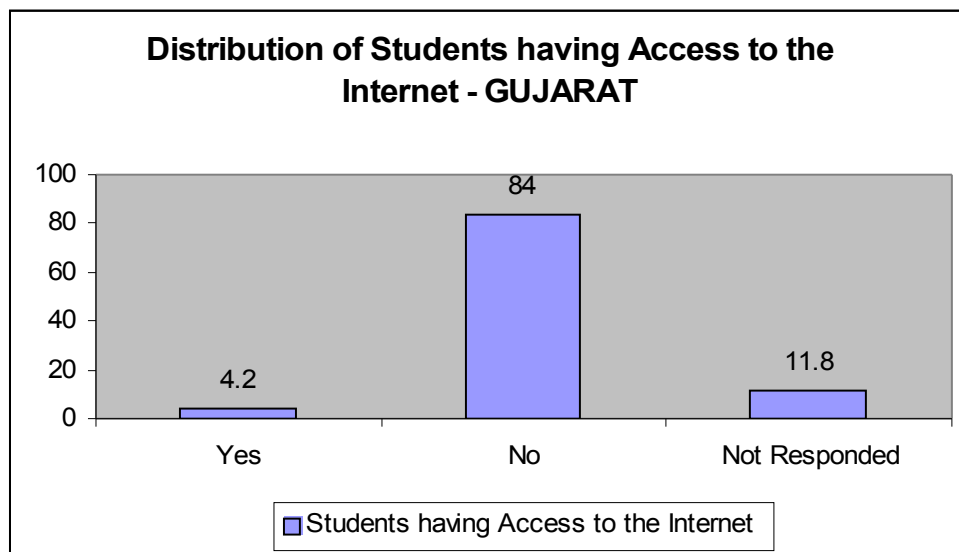
The access of girls to ICT tools and facilities outside school was better than boys in both the States. The highest percentage of such access was of girls in Gujarat at their own homes.

**Table : S 21.5**  
**Gender distribution of Students having access to ICT Tools at places other than school**

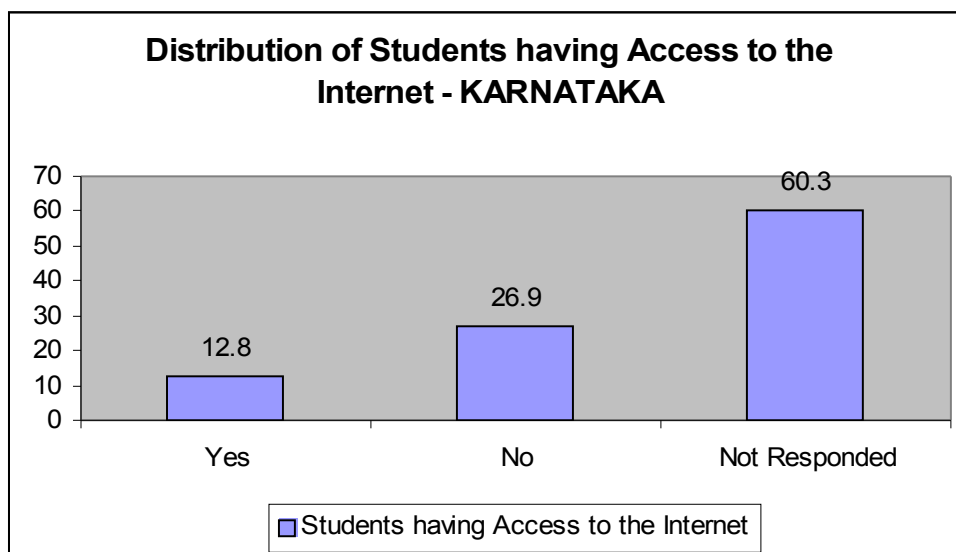
Places	Gujarat		Karnataka	
	Boys	Girls	Male	Female
Home	3.9	14.3	2.2	3.4
Commercial Places	2.8	6.0	5.6	5.6
Friend's House	4.4	10.0	2.8	3.6
ICT Training Center	2.3	2.0	0.5	2.0
Others	1.0	0.9	0.2	0.2

The low accessibility to the Internet is a fact of life in the interiors of the country. This is corroborated by the evidence gathered during the survey. Only 4.2% students stated that they had access to the Internet in Gujarat. The same number was 12.8% in Karnataka. The best placed was Bangalore at 18.9% in this regard (**Annexure XXI**).

**Figure : S 22.1**



**Figure : S 22.1**



Analysing the data according to the location of the school it was found that access to the Internet was more in urban areas of Gujarat (7.8%) than in the rural areas (2.6%). In Karnataka, there was not such a great difference in availability between urban and rural areas.

**Table : S 22.2**  
**Area orientation of Students Having Access to the Internet**

Access	Gujarat				Karnataka			
	Urban	Semi-urban	Rural	Total	Urban	Semi-urban	Rural	Total
Yes	7.8	3.5	2.6	4.2	12.4	15.5	12.6	12.8
No	77.5	89.8	86.2	84.0	32.0	35.4	21.9	26.9
Not Responded	14.7	6.8	11.2	11.8	55.6	49.1	65.5	60.3

While Private School students in Gujarat had four times more access to the Internet compared to their Government School peers, it was just the reverse in Karnataka where 16.6% of Government School students had access to the Internet compared to 5.6% of Private School students.

**Table : S 22.3**  
**Distribution of Students Having Access to the Internet as determined by School Management**

Access	Gujarat		Karnataka	
	Government / Public	Private	Government / Public	Private
Yes	1.5	6.9	16.6	5.6
No	83.9	84.0	21.5	37.1
Not Responded	14.5	9.1	61.9	57.3

In both the States Secondary School students had much better access to the Internet.

**Table : S 22.4**  
**Academic level of Students Having Access to the Internet**

Access	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Yes	1.9	6.7	2.7	19.0
No	85.6	82.3	23.6	28.9
Not Responded	12.5	11.1	73.7	52.0

**Table : S 22.5**  
**Gender Distribution of Students Having Access to the Internet**

Access	Gujarat		Karnataka	
	Boys	Girls	Boys	Girls
Yes	3.9	4.5	11.2	14.3
No	80.2	88.2	26.0	27.8
Not Responded	15.9	7.2	62.8	57.9

The next question related to the frequency of the use of Internet for surfing websites in schools. Keeping in mind the fact that the availability of and access to the Internet is extremely low in the country, the responses were in line. 55.4% of the students surveyed in Gujarat stated that they had never surfed the Internet. The proportion of students who surfed the net daily was 0.1%, certainly a privileged minority. The maximum access as would be expected was available to students in Ahmedabad and

the least to the students in Surendranagar. In Karnataka 22.8% of the students surveyed had never surfed the Internet and only 1.3% stated that they use the Internet daily. There was however better availability of access to the Internet in Karnataka than in Gujarat. The responses to once a month and once a week usage was much better in the districts of Bellary and Mandya compared to the districts in Gujarat. Students in Ahmedabad who claimed to access the net several times a week was only 1.3% while the same proportion was 18.9% in Bangalore.

**Table : S 23.1**  
**Students' frequency of surfing websites in school**

Frequency	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Never	38.0	73.8	81.2	55.4	29.6	30.8	5.7	20.8
Once a month	57.8	26.2	6.1	38.9	34.0	43.2	42.9	40.1
Once a week	2.8	0.0	8.8	3.8	14.3	25.0	45.1	29.3
Several times a week	1.3	0.0	3.9	1.7	18.9	0.3	6.1	8.5
Daily	0.3	0.0	0.0	0.1	3.3	0.7	0.2	1.3

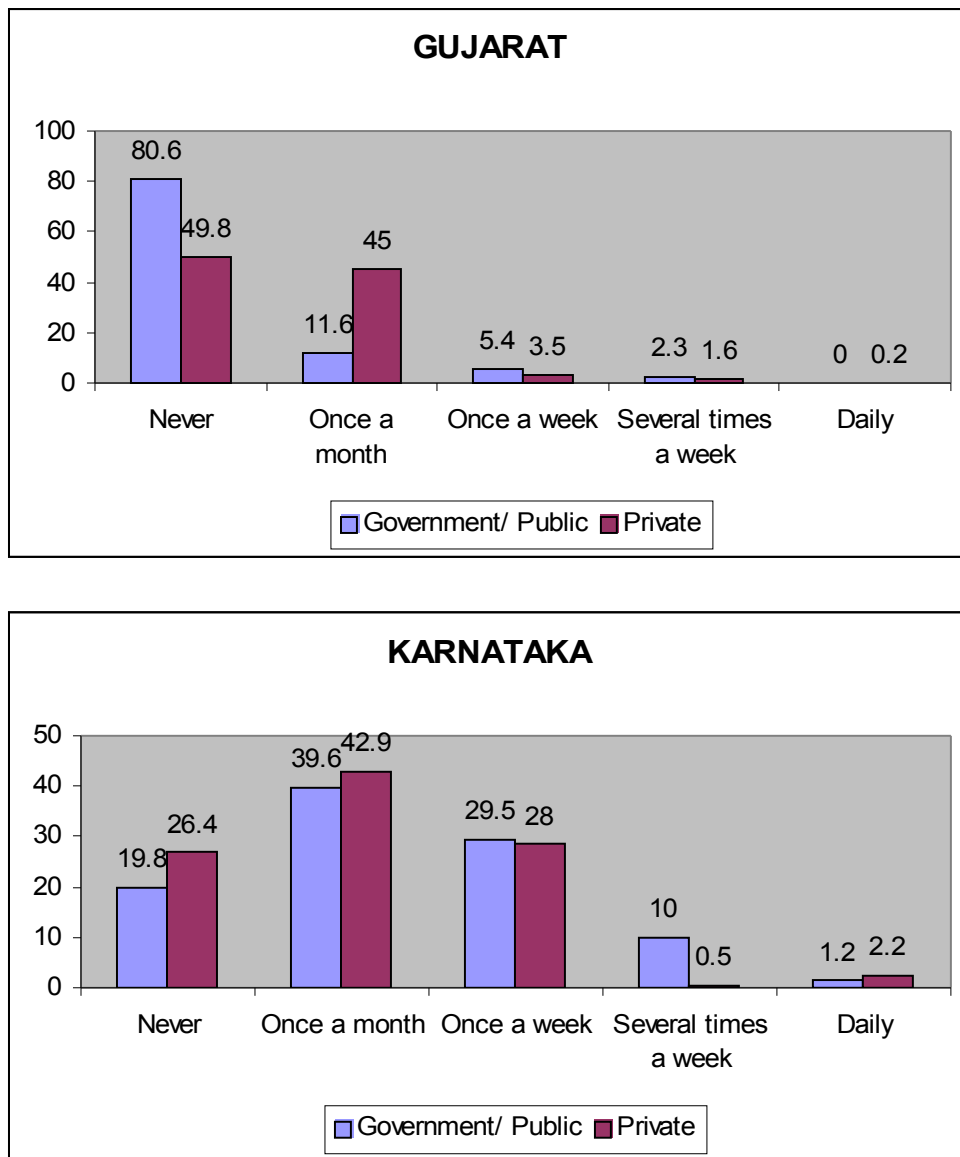
The frequency of using the Internet for surfing websites in schools was distinctly better in urban areas of both Gujarat and Karnataka. However, the frequency of usage once a week in Karnataka was more in the rural areas than in the urban areas.

**Table : S 23.2**  
**Frequency of surfing websites in school according to Area**

Frequency	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Never	38.7	65.4	76.9	20.3	22.5	20.8
Once a month	56.8	11.5	19.0	47.6	16.1	39.2
Once a week	2.9	13.5	3.3	17.6	61.4	31.7
Several times a week	1.3	9.6	0.7	11.2	0.0	8.2
Daily	0.3	0.0	0.0	3.3	0.0	0.2

In Karnataka, Government School students had a higher frequency of using the Internet in school whereas in Gujarat it was the Private School students who were more privileged. Comparing Government Schools in the two States it was found that access to the net was better for students of Government Schools in Karnataka.

**Figure : S 23.3**  
**Frequency of surfing websites in school according to School Management**



Girls had better access to the Internet in both Gujarat and Karnataka and it was best for Karnataka girl students where four times the number of boys claimed to be able to access the net on a daily basis.

**Table : S 23.5**  
**Frequency of surfing websites in school according to Gender**

Frequency	Gujarat		Karnataka	
	Boys	Girls	Boys	Girls
Never	61.7	49.4	25.4	17.2
Once a month	30.5	46.9	40.4	39.9
Once a week	6.3	1.4	23.8	33.6
Several times a week	1.4	1.9	10.0	7.4
Daily	0.0	0.3	0.5	2.0

Students were also queried during the survey about their possession of mobile phones, hand-held/PDA, E-mail addresses or personal website/web-page. As would be seen from the Table below, 5.9% of the total number of students surveyed in Gujarat had a mobile phone. This figure reached a high of 14.1% in Ahmedabad. Karnataka students had the maximum number of E-mail addresses. The district of Mandya in Karnataka had the maximum number in this category.

**Table : S 24.1**  
**Distribution of Students Having Different Means of Communication**

Means	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Mobile Phone	14.1	3.4	3.9	5.9	7.8	1.0	0.1	2.1
Handheld/PDA	0.8	0.7	0.2	0.5	0.8	2.1	0.0	1.0
E-mail Address	4.8	0.1	0.1	1.1	9.4	5.2	9.5	7.7
Personal WEB Site/WEB Page	0.2	0.0	0.7	0.3	0.5	0.0	0.0	0.1

The urban rural divide was apparent in the possession of these facilities in both Gujarat and Karnataka. However, the number of E-mail addresses were found to be marginally more in the rural areas of Karnataka when compared to their urban counterparts.

**Table : S 24.2**  
**Area orientation of Students Having Different Means of Communication**

Means	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Mobile Phone	14.2	8.8	1.7	5.2	0.1	0.2
Handheld/PDA	0.6	0.6	0.4	0.5	0.0	1.6
E-mail Address	3.7	0.4	0.1	8.1	2.4	8.3
Personal WEB Site/WEB Page	0.1	0.1	0.4	0.3	0.0	0.0

The number of mobile phone possessors was more than 10 times in Private Schools in Gujarat when compared to the Government School students. None of the Government School students had a PDA or an E-mail address or a personal website. In Karnataka the differences were not so stark. Infact, the number of E-mail IDs was more in Government Schools than in Private ones.

**Table : S 24.3**  
**Distribution of Students Having Different Means of Communication according to School Management**

Means	Gujarat		Karnataka	
	Government/ Public	Private	Government/ Public	Private
Mobile Phone	1.0	10.9	0.8	4.6
Handheld/PDA	0.0	1.0	1.3	0.5
E-mail Address	0.0	2.2	9.9	3.7
Personal WEB Site/WEB Page	0.0	0.6	0.1	0.2

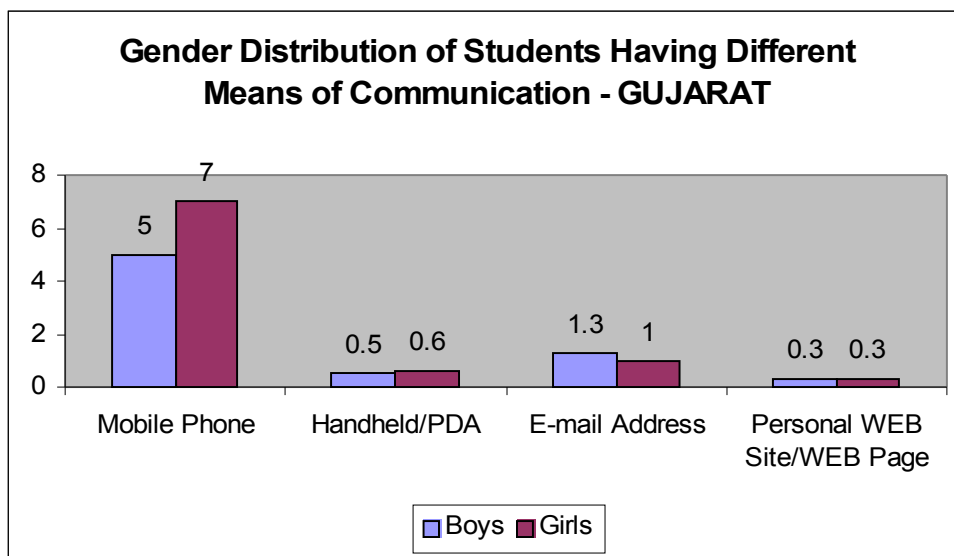
In both Gujarat and Karnataka these facilities were more available to Secondary School students. Surprisingly a substantial number of Primary School students in Gujarat had mobile phones when contrasted with Primary School students in Karnataka. A larger number of Secondary School students had E-mail addresses.

**Table : S 24.4**  
**Academic level of Students Having Different Means of Communication**

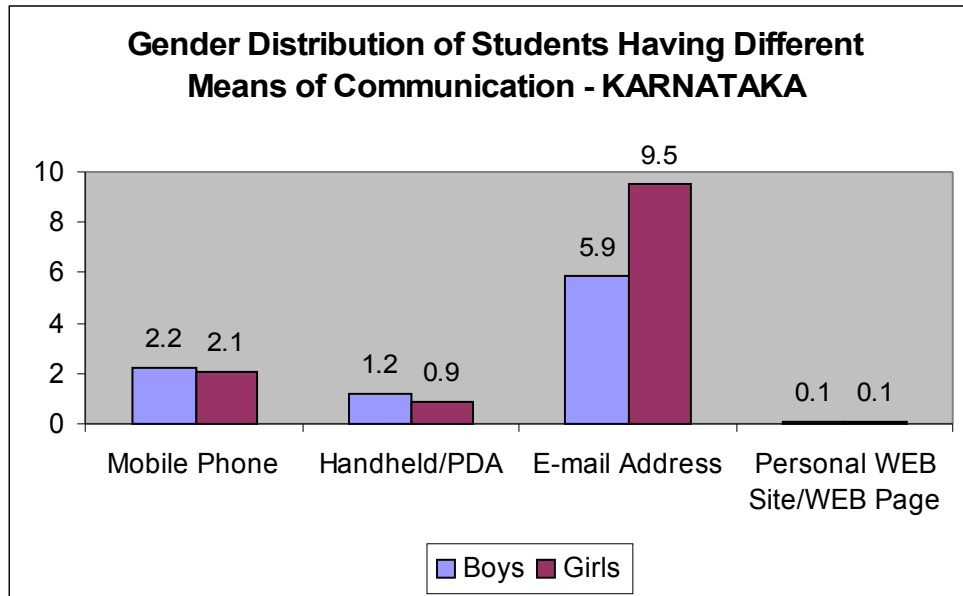
Means	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Mobile Phone	2.9	9.2	1.1	2.8
Handheld/PDA	0.1	1.0	0.1	1.6
E-mail Address	0.5	1.8	0.4	12.3
Personal Web Site/WEB Page	0.0	0.6	0.0	0.2

In Gujarat more girls had access to these means than their male counter-parts. This was true for girls in Karnataka also. However, more boys in Gujarat had mobiles and more boys in Karnataka had E-mail addresses. Interestingly while only 1% of the girls in Gujarat had E-mail addresses, 9.5% of the girls had them in Karnataka.

**Figure : S 24.5**

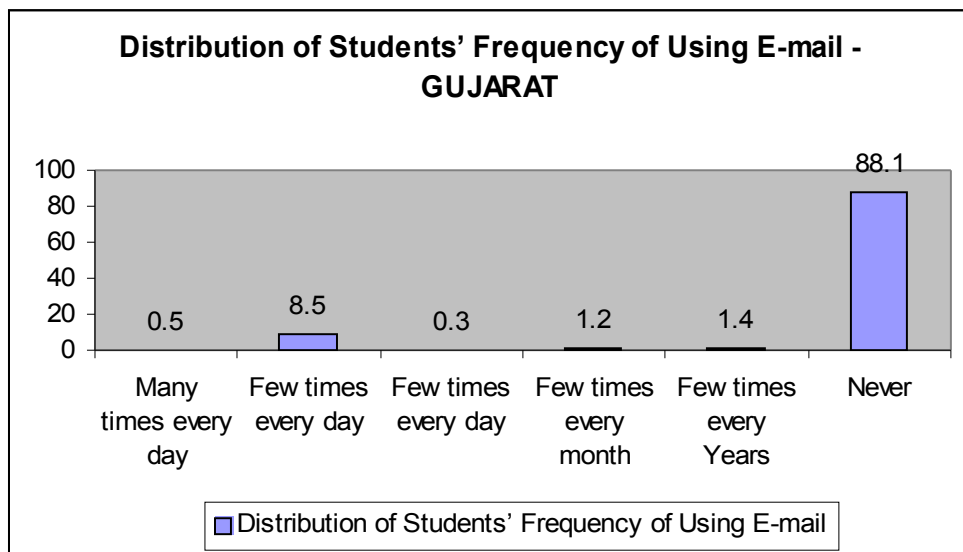


**Figure : S 24.5**

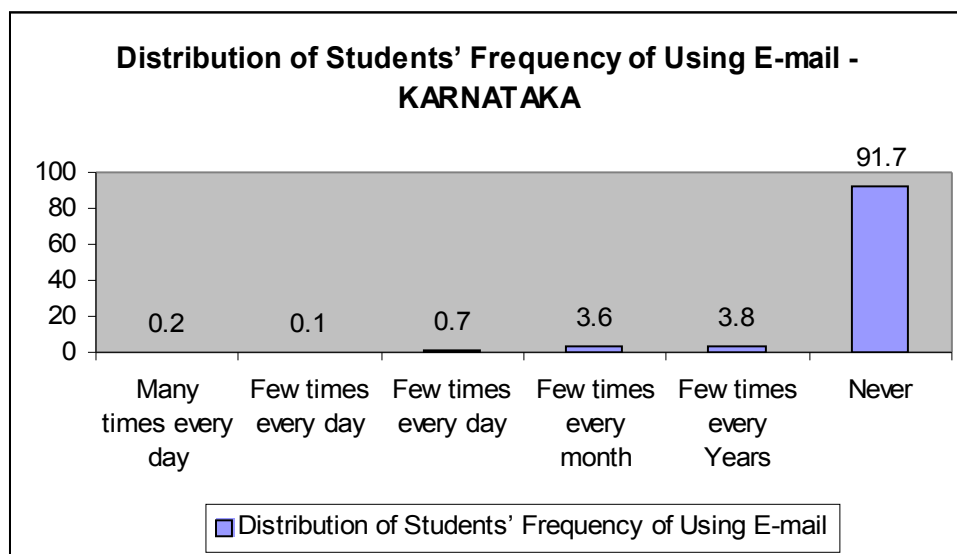


When asked about the frequency of use of E-mail, students in both Karnataka and Gujarat confessed to very little usage. Infact 91.7% of students in Karnataka and 88.1% of the students in Gujarat had never used E-mail. In Karnataka, the maximum usage was a few times every month, that too in Bangalore.

**Figure : S 25.1**



**Figure : S 25.1**



There was marginally more usage in the urban areas of E-mail as would be seen from the Table depicted below.

**Table : S 25.2**  
**Area orientation of Students' Frequency of Using E-mail**

Frequency	Gujarat			Karnataka		
	Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Many times every day	0.5	0.4	0.5	0.2	0.1	0.1
Few times every day	4.5	2.0	11.3	0.1	0.0	0.1
Few times every week	0.6	0.0	0.2	1.2	0.1	0.4
Few times every month	3.3	0.1	0.4	4.0	3.3	3.3
Few times every Year	4.0	0.0	0.4	4.5	0.3	3.9
Never	87.1	97.5	87.2	89.9	96.2	92.3

Surprisingly, the percentage of students who used E-mail as a means of communication was marginally better in Government Schools in Gujarat and little better for Government Schools in Karnataka.

**Table : S 25.3**  
**Distribution of Students' Frequency of Using E-mail according to School Management**

Frequency	Gujarat		Karnataka	
	Government /Public	Private	Government /Public	Private
Many times every day	0.3	0.7	0.1	0.2
Few times every day	11.5	5.5	0.1	0.1
Few times every week	0.0	0.5	0.4	1.2
Few times every month	0.4	2.0	4.4	2.1
Few times every Year	0.1	2.7	4.9	1.9
Never	87.6	88.5	90.2	94.4

As would be expected it were the Secondary School students in both Karnataka and Gujarat who used E-mail more.

**Table : S 25.4**  
**Students Frequency of Using E-mail according to Academic level**

Frequency	Gujarat		Karnataka	
	Primary	Secondary	Primary	Secondary
Many times every day	0.3	0.7	0.1	0.2
Few times every day	10.5	6.4	0.0	0.1
Few times every week	0.1	0.5	0.1	1.0
Few times every month	0.3	2.1	0.1	5.7
Few times every Year	1.7	1.1	0.5	5.9
Never	87.0	89.2	99.1	87.1

Analysing the data according to the gender of the students it was found that boys used E-mail more than girls in Gujarat while it were the girls who used them more in Karnataka.

**Table : S 25.5**  
**Students' Frequency of Using E-mail according to Gender**

Frequency	Gujarat			Karnataka			Total
	Boys	Girls	Total	Boys	Girls	Total	
Many times every day	0.7	0.3	0.5	0.2	0.1	0.2	0.3
Few times every day	13.4	3.0	8.5	0.1	0.1	0.1	4.1
Few times every week	0.4	0.2	0.3	0.7	0.7	0.7	0.5
Few times every month	1.2	1.2	1.2	3.2	4.0	3.6	2.5
Few times every Year	1.3	1.6	1.4	2.4	5.3	3.8	2.7
Never	83.0	93.7	88.1	93.4	89.9	91.7	90.0

#### **IV. MINISTRIES OF EDUCATION**

In a situation where National and State Governments are struggling with serious issues like high drop-out rates, lack of adequate number of teachers & school buildings, the issue of integrating technology in education has been pushed to the periphery. This was evident from the fact that none of the two States in which the survey was conducted had a policy on ICT in education. Neither did the National Government.

Both the States reported that of the total budget for education the proportion allocated for ICT was not significant. In Karnataka it was 8% and in Gujarat it was 10.75% of the Plan expenditure. In Dollar terms this came to \$ 66,55,814 for Gujarat. Karnataka reported that of the total budget allocated for ICT 57% was spent on hardware and software procurement and installation. The rest was kept aside for training, maintenance, software licenses and connectivity. Gujarat also reported that a major proportion of the funds were allocated for hardware and software procurement and installation. Though there was no national or sub-national policy on ICT in education, the State Governments were implementing it as a project of the Ministry. The project did not specifically target minorities but had a provision for focusing on Educationally Backward Blocks (EBBs) of the country. The Computer Education Plan to be prepared by each State had to include at least 2 schools from each of the educationally backward blocks to qualify for assistance under the ICT @ school scheme.

Karnataka provided the following information on the programmes being undertaken by the State for implementation of ICT:-

Projects/Programmes	Duration	Coverage
a. Mahithi Sindu Project	5 years – 2001-02 – 2005-06	1000 Govt. High Schools
b. Eleventh Finance Commission	3 years – 2003-04 – 2005-06	88 Govt. High Schools
c. Revised Class Project	3 years - do -	150 Govt. High Schools
d. Sarva Shiksha Abhiyan with Azim Premji Foundation	No time limit	235 Primary Schools

In Gujarat, the CLASS Scheme was operational as was a scheme sponsored by the State Government since 1998.

In Karnataka the scope of the programme was regional and limited to the formal education system comprising both the primary and secondary levels. The same was true for the State of Gujarat also. Both Karnataka and Gujarat reported that there was a prescribed curriculum by the State Department of Education for ICT. Policy-makers in Karnataka stated that ICT was taught in the classroom both as a separate subject and also integrated with some subjects. As a separate subject and also integrated with other subjects it was taught for two classes of 40 minutes duration each per week. Officials in Gujarat stated that it was not possible to average the number of hours per subject that integration took place. This was because of the fact that there was great diversity between schools in the matter. The State, however, reported that ICT was taught as a separate subject, integrated with some subjects and also as an elective.

Both in the State of Karnataka and Gujarat it was in the secondary classes (standard VIII onwards) that ICT was first taught as a subject.

The state wise data relating to the total number of schools, their enrolment, teachers' trend and access of schools to various ICT tools is provided in **Annexure XXII & XXIII.**

\*\*\*\*\*

## **CHAPTER V**

### **AN ANALYSIS OF VALIDITY, ACCESSIBILITY AND FUNCTIONALITY OF INDICATORS**

A survey of 1,000 schools in the country was primarily to test the indicators developed by UNESCO. A list of these indicators is available in the Chapter on Objectives. To recapitulate, the indicators evaluated the following:-

- Component 1. ICT Based Policy and strategy.
- Component 2. ICT infrastructure and Access.
- Component 3. Curriculum and textbooks.
- Component 4. Teaching Professionals use and Teaching.
- Component 5. Student use and learning.

The Indian survey has largely adopted the indicators proposed by UNESCO and modified them to Indian conditions. Basically, these ICT indicators evaluated the following in their survey of schools, teachers and students:

#### **Indicators to evaluate ICT use in schools:**

- 4. Access to telecommunication facilities
- 17. Access to ICTs and related ICTs
- 18. Use of ICTs for education vis-à-vis administrative use
- 19. Hardware used (CD Drive, operating system)
- 20. Connectivity (networked, Internet connection, kinds of Internet connection, have website, have E-mail)
- 21. Software (applications for word processing, spreadsheets, database, graphics, presentation, educational software, etc.)
- 22. Presence of ICT unit, coordinator, master plan and budget
- 23. Use of computers by number of teachers and students

24. Frequency of use of computers for teaching/learning
25. Frequency of computer use for various purposes
26. Number of teachers trained at both pre-service and in-service level
27. Number of hours spent for using computers, Internet and computer lab
28. Number of hours used for teaching about computers as a separate subject; for using it as integrated into teaching specific subjects and special programme

### **Indicators to evaluate utilization of ICT by Teachers**

4. Percentage of teachers who have received training in the last three years
5. Level of ICT training (basic, intermediate, advance); percentage of teachers trained by levels of training (as against the total number of teachers)
6. Access to ICTs- ICTs personal ownership
7. ICTs used in school
8. Frequency of use of ICTs
9. Access to ICTs –location, inside and outside of schools
10. Levels of skills/expertise in use of ICTs, Level of expertise in the use of ICT (percentage of teachers who use computers by level of expertise for each use)
11. Purpose of use of computers for teaching and frequency (percentage of teachers who use computers by purposes of use and frequency of use)
12. Subjects for which ICTs is used

### **Indicators to evaluate ICT use by students**

1. Access to computers at home
2. Access to computers in school and frequency of use
3. Location of computers
4. Number of hours of computer use in various locations
5. Number of hours of Internet use in various locations
6. Number of students with ICT access outside of schools and in various locations
7. Level of skills/expertise in using computers
8. Source of learning of computers

9. Subjects for which computers are used
10. Percentage of students who are using computers for various purposes and degree of use
11. Fee charged for use of computers

### **Indicators to evaluate ICT-based Policy and Strategy**

1. Existence of National/sub-national policy on ICT in education
2. Existence of Master plan with a time frame
3. Quantum of Budget appropriated for ICT
4. Organisational structure in charge of ICT for education
5. Scope and level of ICT programme
6. Monitoring and evaluation mechanism
7. Statement of inclusion of women, minorities and those with special needs
8. Existence of technology plan in schools

Each of these indicators was analysed in terms of whether:-

1. The indicator used was valid and widely understood. The surveyors found the indicator as easily acceptable and useful.
2. The indicator was a direct measure, rather than a proxy that depends on assumptions for its validity. No other indicators can substitute for it.
3. The indicator was unambiguous about what is being measured. It only produced one absolute result or outcome.
3. Different data collectors collected comparable data based on the indicator.
4. Definition remained stable over time, so change was measurable. No change occurred in the environment during data collection.
5. The Indicator was unidimensional (measured only one thing at a time).
6. It was a valid indicator of the concept that it was supposed to represent. For example, one needs to examine whether a count of number of computers in school is a valid measure for access?

7. Either by itself or with a minimal companion set of indicators, the indicator provided reasonable confidence that it accurately measures the attribute.
8. The Indicator was reliable within the context of the evaluation purpose and resources.
9. Data-collection process was consistent across different time and space scales, using comparable methods and sampling procedures and the indicator was based on representative data.

A tabular assessment based on the feedback received from the Implementing Team of the validity, accessibility & functionality of the indicators developed is given below-

**Indicators to evaluate ICT use in schools:-**

1. Access to telecommunication facilities:-

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

2. Access to ICTs and related ICTs:-

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

3. Use of ICTs for education vis-à-vis administrative use:-

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

4. Hardware used (CD Drive, Operating System):-

Sl. No.		Yes	No
1.	Valid and understood		✓
2.	Acceptable and useful		✓
3.	Direct Measurement		✓
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change		✓
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute		✓
9.	Reliable	✓	
10.	Consistent	✓	

The feedback received on this indicator—hardware used—suggested that most of the respondent did not find a direct linkage between the various types of operating systems or the technological features of the hardware being used and the level of ICT integration into education. The validity, acceptability, usefulness and direct measurement of the attribute were therefore limited. However, the indicator was amenable to collection of comparable data, which was reliable and consistent.

5. Connectivity (networked, Internet connection, kinds of Internet connections, have website, have E-mail):-

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

6. Software (applications for word processing, spreadsheets, database, graphics, presentation, educational software, etc.):-

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

7. Presence of ICT unit, coordinator, master plan and budget:-

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

8. Use of computers by number of teachers and students:-

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

There was no distinct question in the questionnaire for the Heads of schools for assessing the frequency of use of computers for teaching or learning. While the quantum of access to the schools' computers by students and teachers was evaluated through Question Number 23 & 24 the frequency was not. However, in the questionnaire for students Question Number 16 did relate to the degree of usage (ranging from very often to not at all) of ICT in school work. This indicator, therefore, could not be tested completely.

9. Frequency of use of computers for teaching/learning:-

Sl. No.		Yes	No
1.	Valid and understood		
2.	Acceptable and useful		
3.	Direct Measurement		
4.	Un-ambiguous		
5.	Collection of comparable data		
6.	Measures inter-temporal change		
7.	Unidimensional		
8.	Reasonably accurate measurement of attribute		
9.	Reliable		
10.	Consistent		

10. Frequency of computer use for various purposes:-

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous		✓
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

While the indicator (frequency of computer use for various purposes) had all the required attributes it was found to be somewhat ambiguous as the frequency was to be access in terms of always, a lot, sometimes and so on. Precise definitions of these terms would have been useful. Possibly these could have been substituted by the number of hours or periods/classes.

10. Number of teacher trained at both pre-service and in-service:-

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

There was no distinct question in the questionnaire which assessed the number of hours spent for using computers unlike Question Number 33 which evaluated the number of

hours in a month when the school accessed the internet. The indicator, therefore, could not be completely tested.

11. Number of hours spent for using computers, Internet and computer lab:-

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

12. Number of hours used for teaching about computers as separate subject; for using it as integrated into teaching specific subject and special programme.

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

## **Indicators to evaluate utilization of ICT by Teachers**

1. Percentage of teachers who have received training in the last three years

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

2. Level of ICT training (basic, intermediate, advance); percentage of teachers trained by levels of training (as against the total number of teachers)

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

There was no distinct question asked to the teachers surveyed whether there was any personal ownership of ICT tools. Question Number 25 however, did assess the use of computers outside school hours. One must however, acknowledge the possibility of access outside school hours through commercial places also.

3. Access to ICTs- ICTs personal ownership

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

4. ICTs used in school

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

5. Frequency of use of ICTs

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

6. Access to ICTs –location, inside and outside of schools

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

7. Levels of skills/expertise in use of ICTs, Level of expertise in the use of ICT (percentage of teachers who use computers by level of expertise for each use)

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

8. Purposes of use of computers for teaching and frequency (percentage of teachers who use computers by purposes of use and frequency of use)

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

9. Subjects for which ICTs is used

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

## **Indicators to evaluate ICT use by Students**

### 1. Access to computers at home

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

### 2. Access to computers in school and frequency of use

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

### 3. Location of computer

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

4. Number of hours of computer use in various locations

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

While access to Internet and the frequency of its use was assessed through Question Number 22 and 23 its accessibility at various locations was not evaluated separately. The validity, accessibility and functionality of the indicator therefore could not be fully tested.

5. Number of hours of Internet use in various locations

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

6. Number of students with ICT access outside of school and in various locations

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

7. Level of skills/expertise in using computer

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

The evaluation of the level of skills/expertise in using computer by the students relied completely on self-assessment. This possibly introduced an element of subjectivity in the process. While external assessment through teachers or heads would have certainly made for more accuracy in the findings its trade-off with further complications cannot be denied.

8. Source of learning of computers

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

9. Subjects for which computers are used

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

10. Percentage of students who are using computers for various purposes and degree of use

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful	✓	
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

11. Fee charged for use of computers

Sl. No.		Yes	No
1.	Valid and understood	✓	
2.	Acceptable and useful		✓
3.	Direct Measurement	✓	
4.	Un-ambiguous	✓	
5.	Collection of comparable data	✓	
6.	Measures inter-temporal change	✓	
7.	Unidimensional	✓	
8.	Reasonably accurate measurement of attribute	✓	
9.	Reliable	✓	
10.	Consistent	✓	

Students were not asked about the existence or quantum of fee for the use of computers in schools. This was assessed through the questionnaire administered to the Heads of schools. The usefulness of this indicator in assessing the integration of technology in education was not completely understood. This was possibly more useful for policy formulation as it indicated the willingness to pay by students and parents and had its implications on funding of ICT programmes.

## **CHAPTER VI**

### **OBSERVATIONS AND RECOMMENDATIONS**

The project on pilot testing of Performance Indicators for Information and Communication Technology (ICT) in Education in India has been one of the largest field level surveys conducted in the country on this issue. The survey took place in the early part of 2004. A total of 1,000 schools, 35,547 students and more than 6,570 teachers were contacted for the purpose. Several issues and concerns have emerged from this exercise. We shall first look at the indicators developed for pilot testing and the questionnaires formulated as a means to the same. Undoubtedly cross-country surveys suffer from national peculiarities. Though globalisation has encouraged wider acceptance and recognition of various terms, unambiguous understanding of some of them still remains. Even supposedly universal terms, like primary education might encompass different grades of schooling in different countries and even within the same country. For instance, in West Bengal Primary education includes classes upto the IVth standard while in Rajasthan, another State, primary schooling encompasses class V too. The following modifications were thus made in the three questionnaires –

#### **Questionnaire for Heads of School**

<b>Sl.No</b>	<b>Q.No.</b>	<b>Original</b>	<b>Modified as/Ignore</b>
1.	II.5	Minority area	Ignore
2.	II.7	Preschool	Ignore
		Post-Secondary	Ignore
		Non-formal education	Ignore
3.	II.8	Preschool	Ignore
		Non-formal	Ignore

### **Questionnaire for Teachers & Teaching staff**

4.	III.6	Minority area	Ignore
5.	III.7	Special School	Ignore
6.	III.14	Preschool Non-formal	Ignore Ignore
7.	III.23	Teachers lounge	Staff room

### **Questionnaire for Students**

8.	IV.4	Minority area	Ignore
9.	IV.5	Special School	Ignore
10.	IV.7	Non-formal	Ignore

The reason for ignoring the term 'minority area' in the Questionnaire for Heads of school was that there are no such areas defined in the country & therefore it would have led to avoidable confusion. Moreover as the survey was confined to formal secondary schools the terms preschool, post secondary and non-formal education as mentioned in the questionnaires were ignored. The government as a policy encourages integration of disabled children in regular schools and for this reason the term 'Special School' was not taken into account. Teachers' lounge is commonly referred to as staff room in India.

### **Observations & Recommendations:**

1) The first major finding of the survey is that the use of ICT in Education is very limited in the country whether measured by the number of schools having an ICT Department or Unit (20.4%), the availability of a budget in schools for its implementation (6.5%), the number of teachers trained at ICT, the per capital availability of hardware and so on and so forth. Infact, the Heads of Schools which reported that all students had access to computers were only 6% in Gujarat and 19.8% in Karnataka. It was found that there is a high percentage of students not using ICT at all. 90.8% of school students in Karnataka did not use ICT in their school work for communication i.e. to exchange and

transmit information using the E-mail and Internet. The corresponding figure was 81.4% in Gujarat.

2) The access to ICT facilities whether by students or by teachers was of great concern. In the 200 schools surveyed in Surendranagar there were only two Multi-media Projectors, three PDAs and four Scanners. Even in Ahmedabad there were only 589 Desktop Computers reported in 100 schools. This means less than six computers per school and one computer for 72 students on an average. As far as access to teachers was concerned, it was found that in both Gujarat and Karnataka school teachers had access to the school's computer for a maximum of only 1-2 hours *per week*. Only for 2.4% of the teachers was a computer available to them for more than 6 hours weekly. There is thus a great need for increasing the availability of various ICT tools.

3) While there is a relatively better availability of older technologies like the TVs or RCPs, newer technological products like Multi-media Projectors, Laptops and PDAs, which make learning more student-centric, were scarce. In the 200 schools in Mandya, for example there was not a single Multi-media Projector, LCD Projector, Scanner or a PDA. The survey found that the abundance of different technologies was directly related to their vintage. Older equipment like TVs, RCPs and Desktop Computers were more abundant than Multi-media Projectors and Hand-held Computers. Even in Ahmedabad as mentioned earlier there were only 589 Desktop Computers reported in 100 schools. This means less than 6 computers per school and 1 computer for 72 students on an average. While Gujarat had a total of 1,004 Desktops in 500 schools Karnataka had an even lesser number of 810 in 500 schools. No school in Karnataka reported the availability of a Video Camera. In Mandya there were no Scanners, LCD Projectors or PDAs.

4) As the increased availability of these technologies in the country would take time, it would be a sensible strategy to concentrate on utilizing traditional media like the radio and the television. These technologies also have an edge over Desktops or Laptops as more students can utilize them at any given time. As mentioned earlier, in Gujarat schools it was the TV and then the RCPs, which were available in maximum numbers.

5) Training of teachers in ICT was another area of concern. A majority of schoolteachers surveyed in the two States were without any training on ICT tools. In Karnataka 87% were not trained and in Gujarat 81% of the teachers had no training in ICT.

6) It was also found that most of the teachers who have acquired training did so while in service. Only 3.1% of the teachers in Gujarat and 5.5% teachers in Karnataka had acquired such proficiency before joining the profession. This obviously has an important implication for the formulation of the curriculum of Teachers' Training Colleges throughout the country and also for the National Council for Teachers' Education (NCTE).

7) An area of concern was the quality of training imparted. When the responding Heads of Schools were queried about the competence of the teachers who had been trained at ICT, many of them reported that though the teaching staff had received training they still had *no* capability ! While this figure was low in Gujarat it was quite significant in Karnataka at 20.2%. Maximum number of teachers was rated as having a fair amount of expertise in Gujarat, while in Karnataka the maximum number was only rated as good. The quality and methodology of training was thus a serious issue and needs to be given greater attention than to mere numbers of teachers trained as at present.

A surprising fact noticed when assessing the level of expertise of the teachers in the various aspects of ICT was that even teachers who were somewhat familiar with ICT, having used it for less than an year had no capability even in simple uses like Word Processing or E-mailing. In Gujarat 63.2% and in Karnataka 57.3% had been using computers for less than a year but had no capability in Word Processing. Again 68.7% of teachers in Gujarat and 67.2% of the teachers in Karnataka who were somewhat familiar with computers had no capability in presentation tools. It thus seems that the quality of training imparted to the teachers was not of a satisfactory level.

8) The hypothesis that even where ICT tools were available there was low level of integration in education was validated as both Principals and teachers stated that ICT tools were most used for teaching ICT as a subject. In Gujarat, for example teachers stated

that ICT was used most for teaching computers as a subject and then for sciences. In Karnataka, computer classes were the second most important subject for which ICT was used. There was little utilization of these tools in Social Science and Music in Gujarat and in Music and Art in Karnataka. Principals reported that they were used least for teaching the local language. The maximum percentage of respondents who stated that one subject for which computers were always used was ICT – both in Gujarat (8.2%) and in Karnataka (11.8%).

Students were also asked which subjects were computers and related ICT tools used for. In both the States, students also used computers and related tools most for computer classes. In Karnataka, mathematics was next while in Gujarat it was Sciences. In both Bellary and Mandya, computers were used most in the computer classes and least for local languages. In Ahmedabad and Patan the results were the same. While in Surendranagar computers were used more for computer classes, their least usage was for music. Schools in India do not attach much importance to teaching of art and music. There was more broad-based usage of computers and related ICT tools for different subjects in Karnataka. There was also more usage for local languages in Karnataka as compared to Gujarat. Two conclusions follow – one, that computers and related ICT tools are primarily being used for teaching computers as a subject and is less integrated in teaching other subjects and two that availability of content for learning other subjects and specially local languages is limited. It is generally thought that the best way to encourage ICT adoption in a country is to make content widely available in the local language(s). Policy makers need to devise an appropriate incentive mechanism to address these issues.

9) The low level of access has been commented upon earlier too. This was true not only for students but also for teachers. Adding the number of Principals, which had not responded, and the ones, which had responded that no teacher had access to computers in their school it was found that 75.2% of the Karnataka teachers did not have access to computers while 71.4% of the teachers in Gujarat were in the same situation. This is a surprising state of affairs in a country, which claims to be an IT superpower. Perhaps there is a need to provide linkages between educational institutions and IT companies to better utilise IT equipment being periodically replaced by them.

10) The lack of Internet connectivity came-up starkly and repeatedly during the survey. This had its own impact on the various uses to which ICT could be put to by both the teachers and students. For teachers, it could be for finding or accessing educational materials, communicating with students, other teachers or with parents, monitoring and evaluating students' progress or for accessing and using on-line assessment tools. For students, it could help in on-line collaborative projects, exchanging assignments and lessons or using Internet resources to prepare home-work, research lessons or for website designing, developing and operating E-learning or On-line learning platforms. However, these uses remained largely unutilized as only 8.6% of the teachers in Gujarat and 8.8% of the teachers in Karnataka had access to the Internet, whether at school or outside.

As far as students were concerned, only 4.2% students stated that they had access to the Internet in Gujarat. This number was 12.8% in Karnataka. In Gujarat 79% of the students surveyed could not E-mail and 78.3% could not browse. In Karnataka an even larger percentage (87.3%) could not E-mail and 89.5% could not browse. The frequency of use of Internet for surfing websites in schools, for example were instructive. 55.4% of the students surveyed in Gujarat stated that they had never surfed the Internet. The proportion of students who surfed the Net daily was 0.1% !

There was only a marginal difference in the usage of ICT tools when assessed according to the type of school-Private or Government-that the student attended. In Gujarat Private School students used ICT marginally more than Government School students for all purposes except for communication. In Karnataka Private Schools used ICT marginally more than Government Schools for communication, creation and functional purposes. Government School students used ICT more to find, acquire and use information.

11) While a relatively larger number of schools had an ICT Department or Unit a much lesser number had an ICT Coordinator to make the entire process effective. The number of schools which had an ICT Master Plan in place was even less. 20.4% of the total number of schools surveyed had an ICT Department or Unit. It is well known that without

trained personnel the hardware is of little use. It was found that only 13.7% of the schools had an ICT Coordinator which was as mentioned earlier less than the number of schools which had an ICT Department. Karnataka was better than Gujarat in this respect and Bangalore had the maximum number of schools with an ICT Coordinator at 23%. Surprisingly, the rural schools in both the capital cities did not have any ICT Coordinator! Purchase of hardware, training of teachers, procurement of educational content, scheduling of classes etc. all have to be part of a master plan to ensure maximum benefits. Very few schools had an ICT Master Plan in place, infact only 7.8%. This comprised 11% of schools in Karnataka and 4.6% in Gujarat. The importance of all these components is widely acknowledged. The data mentioned above only goes to shows that there is little perspective planning taking place. Perhaps there is a need for experts to develop a few model master plans for different types of schools which could be adopted/adapted by them according to their needs.

12) There has been steady but slow progress in the availability of ICT facilities for students in the country. An assessment of the length of time that computers had been with schools was made during the course of the survey. It was found that only a miniscule percentage of schools had computers 8 years back. These were also more noticeable in the urban areas which clearly points to the fact that computers first became accessible in towns. The maximum percentage of schools in Gujarat have acquired computers in the last 1-2 years while it was 2-4 years for Karnataka. The case of rural Karnataka is instructive. While 8 years back there was no computers in any school, now about 18% have computers and the maximum number of computers were acquired in the last 2-4 years.

13) A possible lack of communication in propagating the components of the ICT policy framework to the schools was discerned. Less than 30% of the schools in Gujarat claimed to be implementing the regional policy on ICT. Surprisingly many more Private Schools claimed the same than Government Schools !

The focus of implementation of the Policy on ICT in Education differed in the two States. While in Gujarat the emphasis seemed to be on training teachers on ICT and then

on using ICT in the management and administration of the school, in Karnataka using ICT for teaching specific subjects was most important and then was the training of teachers.

14) The study attempted to find a correlation between the number of years for which teachers have been using computers with the number of years of experience as a teacher. No significant correlation was found. Initiation in the use & practice of ICT was discernable only in the last 2 years. What did come as surprise was that no teacher with more than 20 years of experience in Gujarat claimed to be using computers. The explanation could lie in either the Government deciding as a policy not to train older teachers or the reluctance of the more experienced teachers themselves to learn and use computers. There was no such factor noticeable in Karnataka.

15) What was of interest was that the expertise in the use of computers for various purposes was positively correlated with the number of years that the teacher had used computers. For example, only 11.3% of the teachers surveyed in Gujarat thought of themselves as excellent in using the spreadsheets when they had 2-4 years of experience of using computers. This jumped to 35.8% in the 4-6 years experience bracket. The relevant figures were 8.4% and 32.5% for the teachers in Karnataka. Similarly, while only 2.8% teachers in Gujarat found themselves excellent at graphics with 4 years of experience of using computers, this figure rose to 17.9% after 2 more years.

16) An assessment was made of the level of expertise in the use of various software tools and applications. These ranged from simple ones like Word Processing, Power Point, Internet Browsing to Programme and Project Management. Teachers from Gujarat consistently reported better expertise at these applications than those from Karnataka. Interestingly, however teachers from both the States were best at Word Processing and then at Presentation tools. In Gujarat they were least acquainted with Project Management and in Karnataka with web-page designing. In general the level of expertise was quite low. The expertise at even basic activities like E-mailing and Internet Browsing was fairly low primarily because of the lack of Internet access in schools. The major difference in the level of expertise remained between teachers from Ahmedabad and Surendranagar and those from Bangalore and Mandya. It was found that there was

practically no expertise in higher order skills like web-page designing or data base management.

17) Students were questioned on the level of expertise acquired by them in using ICT tools. These skills were divided into basic, intermediate and advanced. Less than 20% students surveyed in Gujarat assessed themselves as excellent or very good in the basic use of ICT tools. Only word processing got more than 20% responses. The situation was worse in Karnataka where in general only 5-10% assessed themselves excellent or very good at these simple skills. Again, only word processing was relatively better. As stated earlier, there was in general low level of expertise. The conclusion that ICT tools are mostly being used for making presentation or documents but not for developing critical thinking is inescapable.

18) The declining levels of community participation in education came out clearly during the survey in both the urban and rural areas of the two States surveyed. ICT tools were least used for communicating with parents !

19) The location of computers is an important determinant of access to technology by the students. If Desktops are confined to the office or TVs to the residence of the Principal, these technologies would have no impact on the teaching-learning process. An assessment was made of the location of computers in schools. In Gujarat, location of computers in classrooms and in a computer laboratory was evenly distributed. In Karnataka computers were pre-dominantly located in Laboratories. Some were housed in the library also. The maximum number of computers in laboratories were in Bangalore. None of the respondents ticked both classroom and the laboratory as the location of computers in Gujarat.

20) Students were also queried during the survey whether they possessed mobile phones, hand-held/PDA, E-mail addresses or a personal website/web-page. 5.9% of the total number of students surveyed in Gujarat had a mobile phone. This figure reached a high of 14.1% in Ahmedabad. Karnataka students had the maximum number of E-mail

addresses. The district of Mandya in Karnataka surprisingly had the maximum number of E-mail addresses !

21) The general perceptions connected with private school education could not be reinforced by the findings. Infact there was only a marginal difference in the usage of ICT tools when assessed according to the type of school-Private or Government-that the student attended. In Gujarat Private School students used ICT marginally more than Government School students for all purposes except for communication. In Karnataka Private Schools used ICT marginally more than Government Schools for communication, creation and functional purposes. Government School students used ICT more to find, acquire and use information. While Private School students in Gujarat had 4 times more access to the Internet compared to their Government School peers, it was the reverse in Karnataka where 16.6% of Government School students had access to the Internet compared to 5.6% Private School students. Surprisingly, the percentage of students who used E-mails as a means of communication was marginally better in Government Schools in Gujarat and a little better for Government Schools in Karnataka.

Access of Government School students to ICT tools outside school was in general low. The access of Private School students to such devices was comparably better and pre-dominantly at home which implied a better socio-economic condition. This was true for both Gujarat and Karnataka.

The data was compared between Government and Private Schools to assess the effectiveness of the different school systems. In Karnataka, while Private School students were better than their Government counter-parts in Word Processing, Spread Sheet, Graphics, Web Designing and Chatting, the Government School students were better at Presentation Tools, E-mailing and Internet Browsing. Similarly, while Private School students in Gujarat were better at Word Processing, Spread Sheets, Presentation Tools and Graphics, their Government counter-parts were better at E-mailing, Internet Browsing, Web Designing and Chatting. The results were therefore mixed.

Government School students liked to draw and paint most and play games next. It was the other way round for Private School students in Gujarat where 49.8% ranked playing games as their favourite activity using computers! In Karnataka also there was similarity in the choices with Gujarat where most of the Government School students liked to draw and paint most and play games next. The favoured activities of Private School students were the reverse to that of Government School students in Karnataka but same as that of private school students in Gujarat.

22) Government Schools in Karnataka were an example in themselves. School Heads in Karnataka reported that more Government School teachers (6.6%) had access to computers in school than those in Private Schools (4.7%).

While there was no difference in the mode of offering ICT courses or ICT based activities between Private and Government Schools in Karnataka as most offered them first as a separate and then integrated with other subjects, the emphasis on integrating technology was however apparent. The maximum number of hours spent on integrating ICT with other subjects was in Government Schools in Karnataka.

The survey showed that Government Schools in Karnataka had better access to the Internet (11.5%) compared to Private Schools where only 5.9% had such an access. The number of ICT Coordinators in the Government Schools of Karnataka (9.6%) were more than those in Private Schools (7.4%). More Government Schools in Karnataka had a website or an E-mail ID than Private Schools of the State. In Karnataka the number of Government School teachers who were provided training while in service was 3 times the number of Private School teachers trained !

23) One of the assumptions of the study was that most of the ICT facilities are confined to boys and that the girl child is at a disadvantage. What the study revealed was an eye-opener. There were no gender differences discernable. In Gujarat more girls (55.8%) are using computers compared to boys (38.8%) and their numbers are also growing faster. This is apparent in Karnataka also specially in the last 2 years.

The access of girl students is much more to Desktop Computers in Gujarat. Data suggests that it is marginally more than boys for TVs, RCPs and even Lap-tops, CD Writers, Scanners and Computer Speakers. In Karnataka, the access of girl students to various ICT tools in schools is marginally more than boys to TVs, RCPs, Desktops, Computer Speakers, Scanners and CD Writers. Comparing girls in Karnataka with their counter-parts in Gujarat, one finds that RCPs, Desktop Computers and Computer Speakers are more accessible to girls in Karnataka. However, the availability of TVs to girls in Gujarat schools is more. Girl students in Gujarat had a distinctly better access to ICT tools for doing schoolwork. While this was also true for Karnataka the difference with boys was not as pronounced (Table S 17.5). Girls had better access to the Internet in both Gujarat and Karnataka (Table S 23.5) and it was best for Karnataka girl students where 4 times more girls than the number of boys claimed to be able to access the Net on a daily basis.

24) While it was difficult to come to the conclusion as to which among the two States was better in terms of access, utilization and effectiveness of ICT tools, what did come across repeatedly during the analysis was the fact that Gujarat had substantial disparities between its urban and rural areas and Private and Government Schools. For example, when students from the two States were questioned about their access to ICT tools for doing class-work, these ranged from 41.5% in the affirmative in Ahmedabad to 9.1% in the affirmative in Surendra Nagar. Access was more evenly distributed between the capital and the Districts in Karnataka (Table S 17.1).

Similarly in Gujarat access to ICT tools was maximum for Private School students at 28.3%. Only 4.7% of Government School children had such facilities. In Karnataka fortunately there was no digital divide discernable between the Private School and Government School students (Table S 17.3). As mentioned earlier Government School students in Karnataka had better access to the Internet. Overall too there was better availability of access to the Internet in Karnataka than in Gujarat. The responses of students to once a month and once a week usage was much better in the Districts of Bellary and Mandya compared to the Districts in Gujarat (Table S 23.1).

The number of students who had a mobile phone was 10 times more in Private Schools in Gujarat when compared to Government Schools. None of the Government School students had a PDA or an e-mail address or a personal website (Table S 24.3). In Karnataka the differences were not so stark. Infact the number of e-mail IDs were more in Government Schools than in private ones !

25) An analysis of the validity, accessibility and functionality of Indicators was the primary objective of the pilot testing. The study found that all the indicators developed by UNESCO, Bangkok in collaboration with countries in Asia broadly had all the requisite attributes. However, a few of them could not be completely tested during the survey, as there were no separate and distinct questions enumerated in the questionnaires for the purpose. (The questionnaires were designed by UNESCO, Bangkok for all the countries in the region where the pilot testing took place). These included for example, the frequency of use of computers for teaching, personal ownership of ICT tools and accessibility of the Internet at various locations.

The one exemption was the Indicator of hardware used in schools. The feedback received on this indicator suggested that most of the respondents did not find a direct linkage between the various types of operating systems or the technological features of the hardware being used and the level of ICT integration into education. The validity, acceptability, usefulness and capability of direct measurement of the attribute were therefore limited. However, the indicator was amenable to collection of comparable data, which was reliable and consistent.

While the indicator-frequency of computer use for various purposes-had all the required attributes it was found to be somewhat ambiguous as the frequency was to be assessed in terms of always, a lot, sometimes and so on. Precise definitions of these terms would have been useful. The number of hours or periods/classes possibly could have substituted these.

The evaluation of the level of skills/expertise in using computer by students relied completely on self-assessment. This possibly introduced an element of subjectivity in the

process. While external assessment through teachers or heads would have certainly made for more accuracy in the findings its trade-off with further complications cannot be denied.

The usefulness of the indicator – fee charged for use of computer - in assessing the integration of technology in education was not completely understood. This was possibly more useful for policy formulation as it indicated the willingness to pay on the part of students and parents and had its implications on funding of ICT programmes.

26) The Indicators developed by UNESCO, Bangkok in collaboration with selected countries in Asia and the wealth of the data generated while testing them on a pilot basis provided a snap shot of the situation on the ground. During the course of the survey several issues of concern have been identified which provide pointers for policy formulation. However, to ensure that policy formulation remains firmly rooted in ground level realities it is essential to mainstream the collection and maintenance of these Indicators. The NCERT conducts All India Education Surveys periodically where data is collected in the census mode. The survey would become more useful to Policy-makers, Planners and Educationists if the Indicators identified during the course of this study form a part of the survey.

## **References :-**

1. National Policy on Education 1986, Ministry of Human Resource Development, Government of India.
2. Programme of Action, 1992, Ministry of Human Resource Development, Government of India
3. Background paper on Consultative Workshop for Developing performance Indicators for ICT in Education, 2002, UNESCO, Asia.
4. Tenth Plan Document, Planning Commission, Government of India.
5. E-Readiness Assessment of States in India, 2003, National Council of Applied Economic Research, India.

## **INFORMATION AND COMMUNICATION TECHNOLOGY @ SCHOOLS**

### **INTRODUCTION**

Information & Communication Technology (ICT) is universally acknowledged as an important catalyst for social transformation and national progress. However, disparities in the levels of ICT readiness and use could translate into disparities in level of productivities and hence could influence a country's rate of economic growth. Understanding and leveraging ICT is therefore critical for countries striving for continued social and economic progress.

India shows enormous geographic and demographic disparity in ICT use. India has one of the largest ICT workforces in the world. One can find intense ICT use in technology clusters such as Bangalore and Gurgaon or amongst the upper middle brackets of incomes. The other side of the story is that large parts of the country lack even telephone connectivity.

### **BACKGROUND**

India recognized the importance of ICT in education as early as 1984-85 when the Computer Literacy And Studies in Schools (CLASS) Project was initially introduced as a pilot with the introduction of BBC micro-computers. A total of 12,000 such computers were received and distributed to secondary and senior secondary schools through State Governments. The project was subsequently adopted as a Centrally Sponsored Scheme during the 8<sup>th</sup> Plan (1993-98). During the 8<sup>th</sup> Five Year Plan the Scheme was widened to provide financial grants to institutions which were given BBC Micros and also to cover new Government Aided Sec./Sr. Sec. Schools. Assistance included annual maintenance grant for BBC micros and purchase as well as maintenance of equipment for new Schools.

2598 schools having BBC Micros were covered under the CLASS scheme during the 8<sup>th</sup> Plan for providing Instructors, maintenance of hardware, consumables and text books for students and training of teachers in schools. In addition, 2371 schools were covered with new hardware and services which included Rs.1.00 lakh for hardware configuration and Rs.1.30 lakhs per annum for recurring costs. Rs.0.80 lakh per annum was kept as the recurring costs for schools which had already been covered under the BBC-Micros scheme.

NIC was identified as the nodal agency for utilization of the contract for the supply of hardware. The use and supply of software was limited, coverage was confined to Sr. Secondary Schools and the students of class XI & XII had to undergo a Computer Course Module.

National Task Force on Information Technology and Software Development (IT Task Force) – constituted by the Prime Minister – in July, 1998 has made specific recommendations on introduction of I.T. in the education sector including schools. The relevant paragraphs are :

Vidyalathi Computer Scheme, Shikshak Computer Scheme and School Computer Scheme to enable students, teachers or schools respectively, desirous of buying computers to do so under attractive financial packages. These schemes will be supported by a suite of initiatives such as lowering the cost of PCs, easy installment bank loans, computer donations by IT companies and other business houses, bulk donations of computers by NRI organizations, large-volume bargain price imports, multi-lateral funding, etc.

Computers and Internet shall be made accessible to schools, polytechnics, colleges, and public hospitals in the country by the year 2003.

The concept of SMART Schools where the emphasis is not only on Information Technology in Schools, but also on the use of skills and values that will be important in the next millennium, shall be started on a pilot demonstrative basis in each State.

The Report recommended provision of computer systems to all educational Institutions upto Higher Secondary/Secondary Schools by 2020 : investments (about 1-3%) of the total budget during the next five years.

The recommendations of the Task Force have been approved by the Council of Ministers.

The 'ICT in Schools' scheme is a window of opportunity to the learners in the schools of India to bridge this digital divide. The scheme is not a simple merger of the earlier CLASS and ET Schemes but is a comprehensive and well thought-out initiative to open new vistas of learning and to provide a level playing field to school students, whether in rural areas or in the metropolitan cities. The 'ICT in Schools' Scheme is not a stand-alone scheme but actively solicits the partnership of States, Union Territories & other organizations in a mutual endeavour to bridge the heterogeneous proliferation of ICT across different socio-economic and geographic segments in the country. This partnership is manifest in the structure of financing the initiative, in encouraging the development of long-term Computer Education Plans, the setting-up of Smart Schools by KVS/NVS in States as technology demonstrators and in providing for supplementing the States efforts in these areas with no attempt being made to supplant the State Schemes.

The centrally sponsored scheme of 'Educational Technology' and 'Computer Literacy and Studies in Schools' have been suitably modified keeping in view the past experience, the feedback which has been received and changing needs to form the new scheme of 'Information and Communication Technology in Schools'. The component regarding financial assistance to States/UT's for purchase of RCCPs and CTVs under the erstwhile Educational Technology Scheme has been weeded out.

## **OBJECTIVES**

1. To establish an enabling environment to promote the usage of ICT especially in Higher Secondary and Secondary Government Schools in rural areas. Critical factors of such

an enabling environment include widespread availability of access devices, connectivity to the Internet and promotion of ICT literacy.

2. To ensure the availability of quality content on-line and through access devices both in the private sector and by SIETs.
3. Enrichment of existing curriculum and pedagogy by employing ICT tools for teaching and learning.
4. To enable students to acquire skills needed for the Digital world for higher studies and gainful employment.
5. To provide an effective learning environment for children with special needs through ICT tools.
6. Promote critical thinking and analytical skills by developing self-learning. This shall transform the classroom environment from teacher-centric to student-centric learning.
7. To promote the use of ICT tools in distance education including the employment of audio-visual medium and satellite-based devices.

## **DETAILS OF THE SCHEME**

### **COMPONENTS**

The present scheme has essentially four components. The first one is the partnership with State Governments and Union Territories Administrations' for providing computer-aided education to Secondary & Higher Secondary Government Schools. The second is the establishment of SMART schools which shall be technology demonstrators. Universalisation of Computer Literacy through the network of KVS and NVS to neighbouring schools is the third component. The fourth components relates to the activities of SIETs.

### **IMPLEMENTATION PARTNERS**

States/UT Governments, State Institutes of Education Technology, Kendriya Vidyalaya Sangathan, Navodaya Vidyalaya Samiti, Government and Government aided schools systems. Moreover, financial assistance would also be provided to short-listed NGOs/Trusts/Societies and Companies for software development, teaching tools, designing training models, evaluation, monitoring and other contingent expenditure. The State/UT Governments shall be free to partner with private organizations or integrate it with other similar schemes for implementation of the 'ICT in schools' scheme including providing for maintenance. The implementation of the scheme will be multi-modal. The Ministry of Human Resource Development shall consider the entry of the private sector in a Build-own-operate or annuity modal wherever possible. The direct procurement of hardware by the state would be the last resort. The National Council for Teachers Education shall be associated with the scheme in the context of training of teachers in computer-aided learning. The Rehabilitation Council of India would play an important role in projects involving introduction of use of technology for the education of children with special needs.

## **FINANCIAL PARAMETERS**

1. Under the CLASS component of the ICT scheme, the Union Government would provide 75% of financial assistance to State/Uts. The balance 25% of funds would be contributed by the State Governments/Uts. The scheme also provides for contribution of 25% of funds from the MPLAD scheme in addition or as an alternative to State Government contribution. Assistance shall be provided to special category states in the ratio 90:10. The assistance of the Government of India would be for the following items and upto the limits indicated against each item.

2.	10 PCs/Printer/CRT per school inclusive of facilities like scanner, web camera, modem etc. or one server with 10 workstation with accessories.	-	4,05,000
3.	Operating System & Application Software	-	20,000
4.	Educational Software	-	45,000
5.	Furniture	-	16,000
6.	Computer Stationery	-	50,000
7.	Teachers' Training	-	60,000
8.	Internet	-	30,000
9.	Maintenance - 50% of the cost of annual maintenance contract	-	20,000
10.	<u>Monitoring Cost</u>	-	<u>24,000</u>
	<b>Total</b>	<b>-</b>	<b>6,70,000</b>
11.	Recurring Costs, which includes consumables, hardware and network maintenance, monitoring costs, telephone for Internet usage	-	1,34,000

It may be noted that even in the revised norms, it is proposed to have greater in-built flexibility. The States would have the option to incur expenditure on the above items or any other item like generators, preparation of labs for computers including civil repairs and cabling and provision of electricity depending upon their needs and resources, subject to a overall maximum limit of Rs.6.70 lakhs per school. The Central Government's share would be restricted to Rs.5.00 lakhs per school.

The provision for software shall include Learning Management Systems & curriculum based courseware apart from operating systems & other application software.

An amount of Rs.1 crore would be kept aside annually for the Department of Secondary and Higher Education for development of software, teaching tools, designing training models, evaluation, monitoring and other contingent expenditure.

Ministry of Human Resource Development shall endeavour to utilize content development through National education portal. The British Educational Communications & Technology, Agency (BECTA), UK could be considered as a modal incorporating elements of public private partnership.

KVS and NVS would convert one school per State/UT into a SMART school subject to availability of funds. A grant of not more than Rs.25 lakhs would be given per SMART school. This limit may be reviewed in the future if needed. A sum of Rs.2.5 lakhs shall be provided as recurring costs which includes maintenance, consumable, Internet usage & monitoring costs.

In SMART Schools the emphasis would not only be on the use of Information Technology but also on the use of skills and values that will be important in the next millennium. It is hoped that at least one section (of 40 students) in each of the class IX – XII will be fully computerized. Thus a school having 160 computers @ 40 computer for each IX to XII classes may be called a SMART school under the scheme. However, keeping in view the fact that this target cannot be achieved in one go, it is proposed to provide 40 computers to such identified schools. A grant of not more than 25 lakhs per school would be given to KVS/NVS for the purpose.

Both KVS and NVS have identified the schools which will be converted into a SMART School.

Kendriya Vidyalayas and Navodaya Vidyalayas would be given funds at the rate of Rs.20,000/- per neighbourhood school to impart computer literacy to not more than ten neighbourhood schools within a radius of 3 to 4 kilometers to cover 8,000 such schools

over 3 years. The course shall be imparted in the local language if such a demand is received from the beneficiary school. An Advisory committee consisting of the Principal of the Mother School and all Principals of participating schools will manage and oversee the programme.

The financial assistance to SIETs shall be in the project mode. The financial assistance would be provided to SIETs on the basis of the project proposals submitted by SIETs. These project proposals shall be submitted to the Project Monitoring and Evaluation Group which shall assess the proposals submitted as to their utility and quality. Progressively, the administrative expenses of SIETs shall be reduced to zero within five years.

### **ILLUSTRATIVE LIST OF ACTIVITIES**

- Production of Audio, Video and Multi Media programmes in the project mode by the State Institutes of Educational Technology established at Pune, Bhubaneswar, Patna, Lucknow, Hyderabad, Ahmedabad and Thiruvananthapuram.
- Assessment of need for multi-media programmes, preparation of profiles of target groups, design and development of audio-video programmes and other teaching aids, training of State level personnel in the process of educational technology viz. scripting, production of programmes and technical operations of equipment and studios for their production by Central Institute of Education Technology (CIET)/State Institutes of Education Technology (SIET).
- Training to teachers and teacher trainers in the production of low-cost audio-visual aids, help in script development, media production, editing, communication research, setting up and operation of audio and video studios and computerization of its various processes by Central Institute of Education Technology (CIET)/State Institutes of Education Technology (SIET).

- Feeding telecast and broadcast service titled Tarang and Umang respectively on DD-I and AIR and dedicated educational channel Gyan Darshan and Gyan Vani by CIET and SIETs
- Coordination of academic production and technical activities of the 6 State Institutes of Educational Technologies by CIET.
- Organising Educational Film Festivals/Multimedia contests.
- Financial support to States/Uts on the basis of their Computer Education Plans (CEPs).
- Support to KVS/NVS for opening of SMART schools and for imparting computer literacy to students in neighbourhood schools.
- Development of multimedia content for use in schools.
- Digitisation of video and audio cassettes produced by SIETs on the basis of fresh assessment and in partnership with non-governmental agencies so as to make them viable and self-sufficient.
- Establishing and Conferring National Awards for development and use of ICT tools.
- Development of teaching tools, designing training modules for teachers.
- Financial support for conversion of content into regional languages.
- Projects for introduction of use of technology for the education of children with special needs.
- Sale of audio and video programmes made by SIETs on a commercial basis.
- Leasing/hiring of studios and equipment by SIETs to other agencies both Government and non-Government on a commercial basis.
- Training of teachers and master trainers/resource persons in the use of ICT tools for enrichment of curriculum and pedagogy.

## **PROCESS OF EXECUTION**

Each State/UT would formulate a Computer Education Plan (CEP). The CEP would indicate the steps already taken by the State Government/Uts and the assistance, which they now require. The project proposals should inter-alia indicate number of schools in the state (government, government aided), the number already having computers, the number of schools now proposed to be covered and within what period, number of students likely to be benefited, whether State Government/UT's have made provision for the States share in their budget, vendors which have been short listed for procurement of equipment, provision of training, availability of infrastructure etc. While preparing the CEP, the State Government/UT will ensure that atleast two schools are selected from each identified Educationally Backward Block for assistance under this scheme.

The proposals for the existing components must indicate the funds received earlier for them, the status of their utilization and benefits accrued in qualitative and quantitative sense.

Efforts would be made for convergence and dovetailing with schemes of other Departments like Ministry of Information Technology whose representative will be invited to the meeting of the Project Monitoring and Evaluation Group. The States/Uts shall be free to dovetail this scheme with existing or proposed schemes of the State Governments.

Funds will be allotted to KVS/NVS for SMART schools and Universalisation of Computer Literacy on the basis of the proposals submitted by KVS/NVS.

The Department of Information Technology would contribute to the scheme by making available its infrastructure resources and expertise to provide internet connectivity to schools.

The GIAC shall be empowered to affect modifications in the scheme based on the feedback received and depending upon changes in the technological environment. As the

shift in technological parameters is rapid, this would ensure that the scheme is able to adapt itself to changing conditions and requirements. Financial norms and budgetary outlays shall, however, be strictly adhered to.

### **GRANT-IN-AID COMMITTEE**

A Project Monitoring and Evaluation Group headed by the Secretary (Secondary and Higher Education) would consider the Computer Education Plans (CEPs) received from the States/Uts. The committee would also include a representative of Ministry of Information Technology, NIC and representatives of organizations engaged in the field of computer education. This Group shall also consider the project proposals submitted by SIETs.

## **RELEASE OF GRANT**

On approval of the project / CEP the grant shall be released to the State/UT/SIET on an annual basis in two or more installments – the first installment of 50% will be released immediately after the issue of sanction. After the State/SIET has utilized 75% of the 1<sup>st</sup> installment it may make a request for release of the subsequent installment along with progress report and statement of expenditure with full details. The release of grants in the second and subsequent years will be made on a similar basis, provided that before release of the second installment in a particular financial year (beginning with the second year) the utilization certificate and audited statement of accounts in respect of grants released till the end of the proceeding year shall be furnished.

## **DISBURSEMENT**

The grants of SIETs/KVS/NVS would be remitted either by Demand Draft drawn in its favour by the Ministry of Human Resource Development or by telegraphic transfer to the savings bank account opened in its name. The grants to States/Uts would be given through Inter Government adjustment advice.

## **MONITORING AND EVALUATION**

The Project Monitoring and Evaluation Group would also function as the Monitoring Committee. In addition, the SIETs and the State/UT Government submitting the proposal would be required to submit progress reports every quarter. The Department would also explore the possibility of getting the 'ICT in Schools' scheme evaluated through an independent agency.

## **ANTICIPATED OUTCOMES**

1. The Scheme shall enable the widespread use of ICT in schools during the 10<sup>th</sup> Plan period leading to enrichment of existing curriculum and pedagogy.
2. The scheme shall enable the students to acquire necessary skills needed for both higher education and for gainful employment.

3. During the 10<sup>th</sup> Plan period a total number of 9380 schools shall be covered for employment of ICT tools.
4. Efforts shall be made to ensure coverage of the scheme in all States and Union Territories of the country during the 10<sup>th</sup> Plan.
5. A system of hosting and accessing quality educational content on a nation-wise basis shall be established. This shall be available online as well as through other access devices.
6. Two SMART schools shall be established in each State and Union Territory by KVS/NVS, which shall serve as technology demonstrators.
7. KVS and NVS shall operationalise the component relating to Universalisation of Computer Literacy and shall cover a minimum of 8,000 schools.
8. Projects to introduce the use of technology for the education of children with special needs shall be established.
9. State Institutes of Educational Technology shall become substantially self-financing.
10. Each SIET shall produce and transmit at least 200 programmes each year.

\*\*\*\*\*

**MAHITHI SINDHU**

The Responsibilities of the Companies, the obligation of the Government & Financial Management of the project are detailed below:-

**Responsibilities of the Companies**

- To supply hardware and software to the Mahithi Sindhu schools.
- To appoint two full time qualified teachers to each school (qualification being BE or B.Sc., with one year diploma in computer training or BCA or Computer Engineering in computer science/higher qualification in computer application).
- To supply text books on computers & ICT as per medium of instruction of the school.
- To impart ICT and ICT based education to students.
- To supply the required furniture, telephone and internet facilities.
- To train the teachers in ICT.
- To assist the Head master in installing and running the software provided by the Department for School Administration.

**Responsibilities of Government**

- To provide power supply to the computer lab of the school.
- Computer lab is to be made dust free and leak proof.
- For the above works Rs.45,000 (about \$1000 ) per school is provided to each of the Zilla Panchayaths (Local Government Units).

## **Financial Management**

The project Mahithi Sindhu is a continuous programme for 5 years. The Companies implementing the project and imparting ICT and ICT based education will be given grants depending on the category of the School as detailed below. This grant will be released to the Companies in 20 equated quarterly installments.

- |    |       |             |
|----|-------|-------------|
| 1. | Cat-A | 14.69 lakhs |
| 2. | Cat-B | 19.10 lakhs |
| 3. | Cat-C | 24.20 lakhs |

\*\*\*\*\*

**RAJIV GANDHI COMPUTER LITERACY PROGRAMME**

Each school will be equipped with the following equipment

- |    |  |   |             |
|----|--|---|-------------|
| a. | Computers  | - | 10          |
| b. | Licensed Software  | - | As required |
| c. | 56 KBPS External Modem   | - | 01          |
| d. | Dot Matrix Printer   | - | 01          |
| e. | 1 KVA UPS with half hour backup through<br>Sealed Maintenance Free Battery                       | - | 01          |
| f. | 500 VA Line Interactive UPS with half hours<br>backup through Sealed Maintenance Free<br>Battery | - | 09          |
| g. | 12 port Hub  | - | 01          |
| h. | Suitable : software for sharing the Internet connecting<br>and logging usage.                    |   |             |
| i. | Computer Table :s or running Table :, chairs and printer Table :.                                |   |             |
| j. | Instructor Table : and Instructor Chairs.  |   |             |
| k. | Internet connectivity wherever feasible.   |   |             |

**NATIONAL POLICY ON EDUCATION  
1986**

**PART VIII**

**REORIENTING THE CONTENT AND PROCESS OF EDUCATION**

**MEDIA AND EDUCATIONAL TECHNOLOGY**

- 8.10 Modern communication technologies have the potential to bypass several stages and sequences in the process of development encountered in earlier decades. Both the constraints of time and distance at once become manageable. In order to avoid structural dualism, modern educational technology must reach out to the most distant areas and the most deprived sections of beneficiaries simultaneously with the areas of comparative affluence and ready availability.
- 8.11 Educational technology will be employed in the spread of useful information, the training and re-training of teachers, to improve quality, sharpen awareness of art and culture, inculcate abiding values, etc., both in the formal and non-formal sectors. Maximum use will be made of the available infrastructure. In villages without electricity, batteries or solar packs will be used to run the programme.
- 8.12 The generation of relevant and culturally compatible educational programmes will form an important component of educational technology, and all available resources in the country will be utilized for this purpose.
- 8.13 The media have a profound influence on the minds of children as well as adults; some of them tend to encourage consumerism, violence, etc., and have a deleterious effect. Radio and T.V. programmes, which clearly militate against proper educational objectives, will be prevented. Steps will be taken to discourage such trends in films and other media also. An active movement will started to promote the production of children's films of high quality usefulness.

\*\*\*\*\*

**Questionnaire for Heads of Schools**

**II.1. Country:**

**II.2. Name of School:**

**II.3. Address:**

**II.4. Telephone No. \_\_\_\_\_; Fax No. \_\_\_\_\_; E-mail: \_\_\_\_\_; Website URL \_\_\_\_\_**

**II.5. Type of area where school is located:**

- urban
- semi-urban
- rural
- minority area (can check with urban, semi-urban or rural)

**II.6. Type of school:**

- government or public
- private

**II.7. Academic level offering (please check all that apply.)**

- Preschool
- primary
- secondary
- post secondary
- nonformal education

**II.8 Enrolment totals**

	Preschool	Primary	Secondary	Post secondary	Nonformal
Male					
Female					

**II.9.Total number of School Personnel (includes teaching, non-teaching, and administrative). (Answer only academic level applicable to your school.)**

	Teaching	Non-Teaching	Administrative
Pre-school			
Primary			
Secondary			
Non-formal			

**II.10. Do you have an ICT Department or Unit?**

( ) Yes                      ( ) No

**II.11. Is there an ICT Coordinator?**

( ) Yes                      ( ) No

**11.12. Does the school have an ICT Master Plan?**

( ) Yes                      ( ) No

**II.13. Please attach ICT Master Plan document here**

**II.14. Is there a school budget for the implementation of the school ICT plan?**

( ) Yes                      ( ) No

**II.14.a If yes, how much?** \_\_\_\_\_

**II.14.b If no, what are the other sources of funds?** \_\_\_\_\_

**II.15.Of the total number of school personnel, please indicate the following:**

	With ICT Training		Without Training
	During Pre-service	While in-service The past 3-years	
Teaching staff			
Non-teaching staff			
Administrative staff			

**II.16. For school staff with training, please indicate number with corresponding level of expertise in ICT use.**

	Excellent	Very Good	Good	Fair	No capability
Teaching					
Non-Teaching					
Administrative					

**Definitions**

- **Fair – being able to operate basic computer functions and Word processing application**
- **Good – Being able to operate at least three MS Office applications (MS Word, Excel, PowerPoint) and use these for preparing lessons, to make classroom presentation, etc**
- **Very Good – All of the above skills used for teaching including the regular use of E-mail and Internet resources**
- **Excellent – all of the above including use of E-mail, Internet surfing and searching; use of ICT in teaching any subjects; development of web pages; participation in e-learning and putting class online**

**II.17. Please check under the appropriate column if the following ICT facilities are available in your available in school. Also please indicate number of units available (to be collected with the help of a technical person)**

	Available		Number of units
	Yes	No	
Overhead projector			
TV			
VCD			
VHS			
DVD			
Video camera			
Photo camera			
Radio/cassette player			
Digital photocopier			
Multimedia projector			
LCD Projector			
Computers:			
Desktop			
Laptop			
Handheld/PDA			
Computer printer:			
Colour printer			

Black and white printer			
Dot matrix			
Laser printer			
Ink jet			
Bubble jet			
Scanner			
CD writer			
Computer speaker			

(As baseline data, we need to know how many are available in schools whether for educational purpose only or not, as sometimes schools with less facilities use both ICT equipment for educational and administration/management purposes.)

**II.18. Where are the computers located in school?**

Computer laboratory

Classroom

Teacher's lounge

Administrator's office

Library

Others (please specify) \_\_\_\_\_

**II.19 How long has the school had the computers?**

Less than 1 year

1-2 years

2-4 years

4-8 years

More than 8 years

**II.20 What kind of operating system do you use in schools?**

Windows

Linux

Apple Macintosh

Unix

DOS

Others

**11.21 The school's computer networking environment is:**

- All the computers are networked
- Some of the computers are networked
- None of the computers are networked

**II.22. Does your school have access to:**

	Yes	No
Reliable Electricity a) Generated power at school b) Connection to electrical grid c) UPS d) Solar e) Wind		
<input type="checkbox"/> Landline Telephones		
Mobile phones		
Fax machines		
Internet		
Satellite connections		
Cable TV		

**II.23 How many students have access to the school's computers?**

- None
- About 10 percent
- About 25 percent
- About 50 percent
- About 75 percent
- All students

**II.24 How many teachers have access to the school's computers?**

- None
- About 10 percent
- About 25 percent
- About 50 percent
- About 75 percent
- All teachers

**II.25. Do your teachers and students have access to the use of ICT facilities after school hours?**

- No, they are never accessible
- They are sometimes accessible
- They are always accessible
- They are accessible for a fee

**II.26. Is your school implementing the national/regional/provincial policy on ICT in education?**

- yes                       no

If no, why? Please provide reasons below:

**II.27. How does your school implement the policy on ICT in education? (please check all that apply).**

- by offering separate computer courses
- by using ICT in teaching specific subjects
- by using ICT in the management and administration of schools
- by training teachers on ICT
- others (please specify)

**II.28. Does your school offer ICT courses/computer education and ICT-based lessons/activities?**

- Yes                       No (if no, please proceed to question no. 21 )

If yes, how are these offered? Also please indicate number of hours allotted for the course.

- |   |   |                          |
|---|---|--------------------------|
| <input type="checkbox"/> as a separate subject          | no. of hours/subject                                  | <input type="checkbox"/> |
| <input type="checkbox"/> integrated with other subjects | approximate no. of minutes of integration per subject | <input type="checkbox"/> |

as an elective no. of hours

integrated with elective subjects approximate no. of minutes   
of integration per elective subject

as a special programme no. of hours

others (please specify) don't know

don't know

**II.29. In which classes or subjects in your school are computers and related technologies used?**

	<b>ALWAYS</b>	<b>A LOT</b>	<b>SOMETIMES</b>	<b>RARELY</b>	<b>NEVER</b>
<input type="checkbox"/> ICT subject					
<input type="checkbox"/> Mathematics					
<input type="checkbox"/> Science					
<input type="checkbox"/> Social sciences					
<input type="checkbox"/> Local language					
<input type="checkbox"/> English					
<input type="checkbox"/> Art					
<input type="checkbox"/> Music					

**II.30. For what purposes do your school use ICT? (You may check more than one purpose as applicable and indicate the level of schooling where such purpose holds true.) Please reply to each only if there is about 25-100% of the total teachers doing it**

Learning enrichment or learning new things

Remedial learning

Regular instruction and training for developing computer skills (i.e., teaching about computers – computer literacy, computer science and programming)

Finding/accessing information and researching through Internet

Communicating with others

As teaching/learning tool for teaching specific subjects

Development of logic, reasoning, critical thinking and problem solving competence

Development of ability to use basic application programs (i.e., word processing, database management, spreadsheets, presentation, graphics, etc.)

For playing games and fun

Helping with school administration and management

Using in test administration, scoring and analysis

- Tracking of pupil/ student performance levels, instructional objectives mastered, instructional objectives currently active, and suggested instructional activities
- Others (please specify) \_\_\_\_\_

**II.31. Do you collect fees for:**

	Yes	No
Computer fee in general	<input type="checkbox"/>	<input type="checkbox"/>
Computer courses?	<input type="checkbox"/>	<input type="checkbox"/>
Use of computers after class by students?	<input type="checkbox"/>	<input type="checkbox"/>
Use of Internet after class by students?	<input type="checkbox"/>	<input type="checkbox"/>
Use of computers by non-formal classes	<input type="checkbox"/>	<input type="checkbox"/>

**II.32. Describe your Internet connection arrangement with your ISP (Internet Service Provider) and indicate speed/ bandwidth. (Please check all that apply.)**

	Speed/bandwidth
<input type="checkbox"/> dial up	<input type="text"/>
<input type="checkbox"/> dedicated dial up	<input type="text"/>
<input type="checkbox"/> leased line	<input type="text"/>
<input type="checkbox"/> ISDN	<input type="text"/>
<input type="checkbox"/> DSL	<input type="text"/>
<input type="checkbox"/> Cable modem	<input type="text"/>
<input type="checkbox"/> Wireless	<input type="text"/>

**II.33. How many hours in a month does your school access the Internet?**

**II.34. How many computers are connected to the Internet either as**

Stand alone                       Networked

**II.35. Who pays for the Internet connection in your school?**

- the school via tuition fee collections
- local government units through the school board
- the national government as included in the budget appropriations
- Parent-teacher association
- others (please specify)

**II.36. Does your school have a website and E-mail?**

a) With website                       Yes                       No

b) With email                           Yes                           No

**II.37. Does your school have educational software applications (CD ROM and videos) for teaching and learning?**

Yes

No

If yes, please list down below software applications being used and indicate if these are commercial software or developed in-house and in which language of instruction

**II.38. Does the school have a code of conduct for use of computers and Internet?**

Yes

No

**II.39. Please approximate number of hours allocated for use of X number of computers and related ICTs by students in the school per year**

**TO BE FILLED OUT IF SCHOOL HAS NOT OFFERED OR INTRODUCED ICT IN SCHOOLS YET**

**II.40. When do you plan to offer computer courses or computer-aided courses in your school ?**

	<b>Computer basic literacy</b>	<b>Computer use in teaching</b>
<input type="checkbox"/> this school year	( ) teachers ( ) students	( ) teachers ( ) students
<input type="checkbox"/> next school year	( ) teachers ( ) students	( ) teachers ( ) students
<input type="checkbox"/> within the next five years	( ) teachers ( ) students	( ) teachers ( ) students
<input type="checkbox"/> no such plans exist	( ) teachers ( ) students	( ) teachers ( ) students
<input type="checkbox"/> Don't know		

**II.41. How will computer courses/computer-aided courses as academic of subject area be offered in your school? (Please check all that apply.)**

based on the national ICT policy

as provided for in the prescribed curriculum

as an elective

as a special programme others (please specify)

**Questionnaire for Teachers and Teaching Staff**

*(This portion is to be filled up by teachers, school librarians, guidance counselors, and others who are assigned teaching roles.)*

**III.1. Name of staff (optional)**

**III.2. Country:**

**III.3. Name of School:**

**III.4. Address:**

**III.5. E-mail address**

**III.6. Type of area where school is located:**

urban

semi-urban

rural

minority area

**III.7. Type of school:**

public /government

private

special school

**III.8. Gender:**

Male

Female

**III.9. Age in years:**

Under 30

30-50

Over 50

**III.10. Number of years in the service:**

**III.11. Designation:**

**III.12. Category:**  teaching  non-teaching

**III.13 Educational Level:**

Highest degree earned:

Undergraduate degree:

Specialization:

**III.14. Academic levels taught: (please check all that apply.)**

- Preschool
- Primary
- Secondary
- Non-formal

**III.15. In which subjects do you use ICT as teaching tool?(Check all that apply)**

- Computer class
- Mathematics
- Science
- Social science
- Local language
- English
- Art
- Music
- Others (please specify) \_\_\_\_\_
- None

**III.16. How many years have you been using computers?**

- Less than one year
- 1-2 Years
- 2-4 Years
- 4-6 Years

**III.17 Did you receive any training on information and communications technology before you joined the teaching profession (pre-service)?**

Yes

No

If yes, please indicate the following:

Title of training received	Who provided training organizer	Total number of hours	Level of training		
			Basic	Intermediate	Advance

**III.18. Did you receive any training in information and communication technology (ICT) over the past 3 years?**

Yes

No

If yes, please indicate the following:

Title of training received	Who provided training organizer	Total number of hours	Level of training		
			Basic	Intermediate	Advance

**III.19. What are your main reasons for attending computer training?**

- Financial
- Prestige
- Career enhancement
- Personal growth
- Training is required
- Others (please specify)

**III.20 Please rate your expertise in the use of the following:**

	Excellent	Very Good	Good	Fair	No Capability
Word processing					
Spreadsheets					
Presentation tools (PowerPoint)					
E-mailing					
Internet browsing					
Statistical tools					
Graphics					
Web page designing					
Programming					
Database management					
Project management					

**III.21 How often do you use ICT tools in the following purposes:**

Very often (everyday)      Often (twice or more a week)      Seldom (a few times a month)      Never

Teaching-learning for specific subjects

Teaching computer skills

Finding/accessing information and educational materials

Making presentations/lectures

Preparing lessons

Communicating with students  
 Communicating with other teachers  
 Communicating with parents

Monitoring and evaluating students' progress  
 or keeping track of student's performance

Preparing reports

Further personal development

Others, please specify

**III.22 Please check under each column to indicate that you have/have no access to computers and Internet in the following:**

Location	Computer		Internet	
	With Access	Without Access	With Access	Without Access
School				
At home				
Commercial places, e.g. cyber cafe				
ICT training course centres				
Others (pls. specify)				

**III.23. Where do you use computers in school?**

- Teachers lounge
  - In my office
  - Administrator's office
  - Classrooms
  - Computer laboratory
  - Library
  - Others (please specify)
-

**III.24. How many hours per week are your school's computers accessible to you?**

- Less than one
- 1-2
- 2-4
- 4-6
- 6-10
- More than 10

**III.25. Do you use computers outside of school hours?**

- Yes  No

**III.26 If you have access to the Internet, how often do you use in the schools?**

- Never
- Once a month
- Once a week
- Several times a week
- Everyday

**III.27 How do you use Internet in your job as a teacher?**

- For teaching specific lessons in various subjects
- For making presentations/lectures
- For preparing lessons
- For communicating with students
- For communicating with teachers
- For accessing and using online assessment tools
- For preparing papers and teaching materials
- For collecting handouts and reference materials
- Others (please specify) \_\_\_\_\_

**III.28. Do you have an email address?**

- Yes  no

**III.29. Do you maintain a personal web page as teaching tool?**

- Yes  no

**Questionnaire for Students**

**IV.1. Country:**

**IV.2. Name of School:**

**IV.3. Address:**

**IV.4. Type of area where school is located:**

urban

semi-urban

rural

minority area (can be combined with urban, semi-urban, and rural)

**IV.5. Type of school:**

public/government

private

special school

**IV.6. Student's name (optional):**

**IV.7 Academic Level:**  primary  Secondary  Non-formal

**IV. 8. Grade/Year Level:**

**IV. 9. Gender:**  Male  Female

**IV. 10. Age in years:**

**IV.11. How many years have you been using computers?**

- Less than 1 year
- 1-2 years
- 2-4 years
- 4-6 years
- More than 6 years

**IV.12 Please indicate whether you have/have no access and using/not using the following in your schoolwork:**

	Access (have physical access)		Use for schoolwork	
	Yes	No	Yes	No
Overhead projector				
TV				
VCD				
VHS				
DVD				
Video camera				
Photo camera				
Radio/cassette player				
Digital photocopier				
Multimedia projector				
LCD Projector				
Computers:				
Desktop				
Laptop				
Handheld/PDA				
Computer printer:				
Colour printer				
Black and white printer				

Dot matrix				
Laser printer				
Ink jet				
Bubble jet				
Scanner				
CD writer				
Computer speaker				

**IV.13. In which classes or subjects do you use computers and related ICTs?**

- Computer class
- Mathematics
- Science
- Social sciences
- Local language
- English
- Art
- Music
- Others (please specify)

**IV.14. Please indicate your level of skills in the use of the following computer applications:**

<b>I. BASIC – SIMPLE USE OF APPLICATIONS FOR PURPOSES OTHER THAN CLASSROOM LEARNING</b>	Excellent	Very Good	Good	Fair	No Capability
Word processing –prepare papers					
Spreadsheets					
Presentation tools (PowerPoint)					
Basic E-mailing					
Basic Internet browsing					
Graphics					
Web page designing					
Use of chatting platform					
<b>II. INTERMEDIATE – USE OF EXISTING APPLICATIONS FOR LEARNING BOTH INSIDE AND OUTSIDE THE CLASSROOM</b>					
Use of applications (word processing, spreadsheets, etc.) in classroom learning of specific subjects					

Use of various applications for doing assignments and lessons					
E-mailing for telecollaboration/online collaborative projects, exchanging assignments and lessons, commenting on papers used in schools					
Use of Internet resources to prepare homework, research, lessons, or for collaborative school projects					
Developing basic and static webpage for schoolwork					
<b>III. ADVANCED – USE OF ICTS TO CREATE AND DEVELOP NEW APPLICATIONS, CONTENTS, LEARNING MATERIALS, ETC.</b>					
Use statistical tools for developing formulations and packages					
Programming					
Database development and management					
Advanced website designing, maintenance and use for teaching/learning					
Developing educational software and new applications					
Developing and operating e-learning or online learning platforms					
Setting up and moderating discussion groups and chats					
Creating web-based and ICT-based multimedia materials					

**IV.15. Who taught you about computers?**

- I have taught myself
- My teachers
- My friends
- My family
- Other students
- Training outside of schools
- Online courses or helpdesk
- Others (please specify)

**IV.16. For what purpose and in what degree do you use ICT in schoolwork?**

Purpose	Very Often (everyday)	Often (twice or more a week)	Sometimes (a few times a month)	Rarely (once in several months)	Not at all
<b>Informative:</b> to find, acquire and use information					
<b>Functional:</b> to use and manipulate existing information for educational purposes using existing information (compile lists of books, abstract and summarize books and materials, use accessed information to prepare homework, compare information)					
<b>Creating</b> – to compose, compile, produce new information (write papers, drawing, programming, make PowerPoint presentations, give oral presentations, prepare newsletter, create own website, etc.)					
<b>Communication</b> – to exchange and to transmit information with other students, teachers and others using email and Internet; to join discussion forum and chats					

**IV.17. In your school, are you able to use the required ICT tools and facilities that you need in doing your subject schoolwork?**

Yes

No

**IV.18. Where do you use computers in school?**

- In a classroom
- In a computer laboratory
- In both classrooms and laboratory
- In the library
- I do not use computers in schools
- Others (please specify)

**IV.19. What are your favourite activities using computers? (Check as many as applicable)**

- Find and research information
- E-mail
- Chat
- Download music
- Play games
- Surf the Internet
- Use educational software
- Write papers
- Write computer programs
- Draw and paint
- Make presentations using PowerPoint
- Others (Please specify) \_\_\_\_\_

**IV.20. If you are using computers and related ICTs, how many hours on the average per week of normal school hours are you able to use these computers and related ICTs to do your studies?**

**IV.21. Where else can you have access and use of these ICT tools and facilities outside of your normal school hours?**

- at home
- in commercial places (cyber café)
- friends' house
- ICT training courses
- Others (pls. Specify) \_\_\_\_\_

**IV.22. Do you have access to Internet?**

- Yes       no

**IV.23. How often do you use the Internet for surfing websites in schools?**

- Never
- Once a month
- Once a week
- Several times a week
- Daily

**IV.24. Please check if you have any of the following?**

- Mobile phone
- Handheld/PDA
- Email address
- Personal website/webpage

**IV.25. How often do you use and send email**

- Many times every day
- A few times every day
- A few times every week
- A few times every month
- A few times every year
- Never

**ANNEXURE – VIII****Area wise Distribution of Staff Surveyed**

<b>District/State</b>	<b>Urban</b>		<b>Semi-urban</b>		<b>Rural</b>		<b>Total</b>	
	N	%	N	%	N	%	N	%
Ahmedabad	812	96.8	6	0.7	21	2.5	839	100.0
Patan	263	19.3	63	4.6	1040	76.1	1366	100.0
Surendranagar	13	1.2	231	21.3	843	77.6	1087	100.0
<b>Gujarat</b>	1088	33.0	300	9.1	1904	57.8	3292	100.0
Bangalore	584	80.7	83	11.5	57	7.9	724	100.0
Bellary	460	34.7	87	6.6	777	58.7	1324	100.0
Mandya	308	25.0	143	11.6	779	63.3	1230	100.0
<b>Karnataka</b>	1352	41.2	313	9.5	1613	49.2	3278	100.0

**Age Distribution of Staff Surveyed**

<b>District/State</b>	<b>Under 30 Years</b>		<b>30 – 50 Years</b>		<b>Over 50 Years</b>	
	N	%	N	%	N	%
Ahmedabad	144	17.2	539	64.2	156	18.6
Patan	368	26.9	840	61.5	158	11.6
Surendranagar	323	29.7	655	60.3	109	10.0
<b>Gujarat</b>	835	25.4	2034	61.8	423	12.8
Bangalore	124	17.1	444	61.3	156	21.5
Bellary	382	28.9	787	59.4	155	11.7
Mandya	265	21.5	784	63.7	181	14.7
<b>Karnataka</b>	771	23.5	2015	61.5	492	15.0

**ANNEXURE – X****Usage of ICT in Different Subjects**

Subject	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
	%	%	%	%	%	%	%	%
Computer Class	20.6	6.1	4.6	9.3	9.9	8.6	6.2	8.0
Mathematics	13.6	2.5	4.6	6.0	7.8	7.1	6.8	7.1
Science	14.1	4.1	4.8	6.9	10.8	7.2	7.9	8.3
Social Science	3.6	0.6	3.2	2.2	6.9	5.0	5.6	5.7
Local Language	5.5	1.6	4.1	3.4	5.5	2.5	4.1	3.8
English	10.0	3.5	2.2	4.7	7.1	3.2	3.3	4.1
Art	9.9	1.7	1.1	3.6	1.9	4.0	3.4	3.3
Music	7.8	1.5	1.8	3.2	0.6	2.1	1.8	1.6
None	38.0	28.5	73.4	45.9	19.6	10.6	5.7	10.8

**Number of In-Service Trained Teachers**

<b>District/State</b>	<b>In Service Training (Past 3 Years)</b>			
	<b>Yes</b>		<b>No</b>	
	N	%	N	%
Ahmedabad	321	40.3	476	59.7
Patan	15	1.1	1294	98.9
Surendranagar	36	3.4	1020	96.6
<b>Gujarat</b>	372	11.8	2790	88.2
Bangalore	93	13.4	601	86.6
Bellary	160	12.8	1087	87.2
Mandya	115	10.1	1021	89.9
<b>Karnataka</b>	368	12.0	2709	88.0

**ANNEXURE – XII****Teachers with E-mail Addresses & Personal Web Page**

	GUJARAT				KARNATAKA			
	Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
	%	%	%	%	%	%	%	%
E-mail	8.3	0.5	1.5	2.8	9.9	2.7	4.2	4.9
Maintain Personal Web Page	1.0	0.1	0.7	0.5	2.2	0.6	1.1	1.1

**Gender distribution of Students**

<b>District/State</b>	<b>Boys</b>		<b>Girls</b>	
	N	%	N	%
Ahmedabad	1592	43.0	2110	57.0
Patan	3371	50.3	3332	49.7
Surendranagar	3949	61.4	2485	38.6
<b>Gujarat</b>	<b>8912</b>	<b>52.9</b>	<b>7927</b>	<b>47.1</b>
Bangalore	1995	49.1	2068	50.9
Bellary	4149	54.5	3469	45.5
Mandya	3180	45.3	3847	54.7
<b>Karnataka</b>	<b>9324</b>	<b>49.8</b>	<b>9384</b>	<b>50.2</b>
<b>Total</b>	<b>18236</b>	<b>51.3</b>	<b>17311</b>	<b>48.7</b>

**Distribution of Students according to period  
of Usage of computers**

<b>District/State</b>	Less than 1 Year	1 – 2 Years	2 – 4 Years	4 – 6 Years	Above 6 Years	Not Responded
	%	%	%	%	%	%
Ahmedabad	15.3	17.5	11.3	19.9	3.3	32.7
Patan	11.4	50.0	2.0	1.0	0.0	35.6
Surendranagar	6.7	8.4	0.8	0.6	0.2	83.3
<b>Gujarat</b>	<b>10.5</b>	<b>26.9</b>	<b>3.6</b>	<b>5.0</b>	<b>0.8</b>	<b>53.2</b>
Bangalore	13.2	24.9	7.9	7.5	4.0	42.4
Bellary	5.4	12.7	6.9	0.7	3.1	71.1
Mandya	4.5	15.9	1.3	0.1	0.0	78.2
<b>Karnataka</b>	<b>6.8</b>	<b>16.5</b>	<b>5.0</b>	<b>2.0</b>	<b>2.1</b>	<b>67.6</b>
<b>Total</b>	<b>8.5</b>	<b>21.5</b>	<b>4.3</b>	<b>3.4</b>	<b>1.5</b>	<b>60.8</b>

**Area orientation of Students having different Level of skills in Basic Computer Applications**

Basic Applications	Level of skills	Gujarat			Karnataka		
		Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Word Processing	Excellent	6.8	7.4	0.7	4.5	0.9	3.1
	Very Good	11.1	12.6	22.7	6.7	12.2	5.7
	Good	13.7	17.9	4.2	11.5	5.1	5.3
	Fair	12.4	5.6	3.8	6.8	4.5	3.7
	No Capability	56.0	56.5	68.6	70.5	77.2	82.1
Spread Sheet	Excellent	3.9	6.2	0.1	1.9	2.3	0.6
	Very Good	10.6	7.2	23.3	3.2	0.7	1.8
	Good	6.3	13.9	1.1	4.7	1.3	1.9
	Fair	7.9	7.5	1.4	4.4	0.3	2.4
	No Capability	71.4	65.2	74.1	85.8	95.5	93.4
Presentation Tools	Excellent	4.9	3.8	0.3	5.5	2.3	3.7
	Very Good	8.5	8.8	22.8	5.4	11.0	5.5
	Good	8.9	16.7	2.2	7.7	1.3	5.0
	Fair	13.1	2.9	1.7	3.4	0.1	1.9
	No Capability	64.6	67.8	73.0	78.0	85.3	84.1
E-mailing	Excellent	1.5	0.1	0.0	2.5	2.4	0.8
	Very Good	6.6	5.3	22.6	2.5	0.1	2.1
	Good	3.4	4.2	0.3	3.6	7.2	3.6
	Fair	7.3	0.9	0.1	6.0	3.7	4.6
	No Capability	81.2	89.6	77.0	85.4	86.6	88.9
Internet Browsing	Excellent	2.0	0.6	0.0	1.7	2.3	1.2
	Very Good	6.1	5.4	22.6	1.9	3.4	1.7
	Good	2.8	4.3	0.4	5.0	6.3	2.8
	Fair	8.7	5.9	0.4	4.1	0.5	4.7
	No Capability	80.4	83.8	76.6	87.3	87.6	89.5
Graphics	Excellent	3.7	0.7	0.1	2.3	3.4	0.8
	Very Good	7.9	8.6	22.7	1.9	3.5	1.0
	Good	7.8	9.2	1.4	4.2	2.6	2.3
	Fair	3.7	2.1	0.8	2.3	0.2	3.5
	No Capability	76.9	79.4	75.1	89.3	90.3	92.5

WEB Designing	Excellent	2.0	3.5	0.0	1.9	0.1	0.3
	Very Good	8.2	6.7	22.7	1.4	0.1	0.1
	Good	6.4	4.0	0.5	2.0	0.7	1.3
	Fair	4.6	5.2	0.7	3.0	0.5	3.0
	No Capability	78.8	80.6	76.1	91.7	98.7	95.3

**ANNEXURE XV (Continued)**

**Area orientation of Students having different Level of skills in Basic Computer Applications**

Basic Applications	Level of skills	Gujarat			Karnataka		
		Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Chatting Platform	Excellent	1.2	3.1	0.0	1.5	0.0	0.6
	Very Good	5.0	5.5	22.9	1.1	0.0	0.2
	Good	1.4	1.5	0.0	1.9	0.1	1.1
	Fair	3.3	0.8	0.0	1.6	3.3	1.2
	No Capability	89.0	89.1	77.0	94.0	96.6	97.0

**ANNEXURE – XVI**

**Academic level of Students having different levels of skills in Basic Computer Applications**

Basic Applications	Level of skills	Gujarat		Karnataka	
		Primary	Secondary	Primary	Secondary
Word Processing	Excellent	1.8	4.5	0.9	5.1
	Very Good	21.1	15.5	1.5	9.9
	Good	3.9	12.7	1.5	11.5
	Fair	5.1	7.9	2.7	6.4
	No Capability	68.1	59.4	93.4	67.1
Spread Sheet	Excellent	0.6	2.9	0.1	1.9
	Very Good	21.1	15.1	0.1	3.5
	Good	2.1	5.5	0.2	4.7
	Fair	2.9	4.9	0.8	4.3
	No Capability	73.3	71.6	98.7	85.6
Presentation Tools	Excellent	1.6	2.2	0.2	6.8
	Very Good	20.5	14.0	0.8	9.0
	Good	3.5	7.6	1.3	8.5
	Fair	2.8	7.6	0.6	3.4
	No Capability	71.5	68.6	97.1	72.3
E-mailing	Excellent	0.1	0.8	0.0	2.6
	Very Good	20.2	12.3	0.2	3.3
	Good	0.9	2.1	0.4	6.1
	Fair	1.0	3.6	1.5	7.2
	No Capability	77.6	81.2	97.8	80.9
Internet Browsing	Excellent	0.2	1.2	0.1	2.4
	Very Good	20.2	12.0	0.0	3.1
	Good	0.8	2.2	0.2	6.3
	Fair	1.9	4.8	1.5	5.7
	No Capability	76.9	79.8	98.2	82.5
Graphics	Excellent	1.2	1.1	0.0	2.6
	Very Good	20.9	13.1	0.0	2.5
	Good	2.7	5.2	1.0	4.3
	Fair	1.3	2.2	0.2	4.3
	No Capability	73.8	78.3	98.7	86.3

WEB Designing	Excellent	0.3	1.5	0.0	1.5
	Very Good	21.3	12.6	0.1	0.9
	Good	1.3	3.9	0.5	2.1
	Fair	1.2	3.3	0.0	4.5
	No Capability	75.9	78.7	99.3	91.0

**ANNEXURE – XVI (Continued)**

**Academic level of Students having different levels of skills in Basic Computer Applications**

Chatting Platform Basic Applications	Level of skills	Gujarat		Karnataka	
		Primary	Secondary	Primary	Secondary
Chatting Platform Basic Applications	Excellent	0.1	1.2	0.0	1.4
	Very Good	20.5	11.5	0.0	0.9
	Good	0.2	0.9	0.1	2.1
	Fair	0.3	1.9	0.1	2.4
	No Capability	78.9	84.5	99.8	93.3

**ANNEXURE – XVII**

**Distribution of Students having different levels of skills in  
Intermediate Computer Applications**

Intermediate Applications	Level of skills	Gujarat				Karnataka			
		Ahmedabad	Patan	Surendra nagar	Total	Bangalore	Bellary	Mandya	Total
Use of Applications in classroom learning	Excellent	3.8	0.0	0.4	1.0	3.0	2.0	0.1	1.5
	Very Good	4.3	41.6	0.7	17.8	5.7	3.5	4.7	4.4
	Good	9.2	1.8	0.5	2.9	10.4	7.1	4.9	7.0
	Fair	7.8	1.0	1.3	2.6	7.1	3.3	3.1	4.0
	No Capability	74.9	55.5	97.2	75.7	73.7	84.1	87.2	83.0
Use of Applications for doing assignment	Excellent	3.2	0.1	0.2	0.8	1.8	1.0	0.7	1.1
	Very Good	2.8	40.9	0.6	17.1	2.9	2.4	0.8	1.9
	Good	5.3	1.7	0.4	2.0	10.4	7.0	3.4	6.4
	Fair	8.6	1.6	0.4	2.6	5.4	1.8	1.4	2.5
	No Capability	80.1	55.7	98.6	77.4	79.5	87.9	93.6	88.2

Internet Resources to Prepare Homework E-mailing for Projects etc.	Excellent	0.7	0.0	0.1	0.2	0.5	1.3	0.1	0.7
	Very Good	0.4	40.7	0.1	16.3	2.0	0.4	0.2	0.7
	Good	2.5	0.1	0.2	0.6	3.7	1.6	1.0	1.8
	Fair	3.3	0.1	0.2	0.8	3.6	1.1	1.0	1.6
	No Capability	93.0	59.1	99.4	82.0	90.2	95.6	97.8	95.2
Internet Resources to Prepare Homework	Excellent	0.4	0.0	0.1	0.1	1.1	1.3	0.1	0.8
	Very Good	0.4	40.8	0.1	16.4	2.0	0.4	1.1	1.0
	Good	1.7	0.0	0.1	0.4	6.8	2.8	1.0	3.0
	Fair	4.4	0.3	0.2	1.2	2.0	2.4	1.9	2.1
	No Capability	93.2	58.8	99.5	81.9	88.1	93.0	95.9	93.1

**ANNEXURE – XVIII**

**Area orientation of Students having different levels of skills in Intermediate Computer Applications**

Intermediate Applications	Level of skills	Gujarat			Karnataka		
		Urban	Semi-urban	Rural	Urban	Semi-urban	Rural
Use of Applications in classroom learning	Excellent	2.9	1.7	0.0	2.1	2.6	0.9
	Very Good	9.2	7.6	23.2	5.0	7.0	3.7
	Good	8.1	4.0	0.4	8.1	5.1	6.5
	Fair	6.2	3.4	0.8	5.7	0.8	3.3
	No Capability	73.6	83.3	75.6	79.2	84.5	85.6
Use of Applications for doing assignment	Excellent	2.5	0.7	0.1	1.9	2.4	0.3
	Very Good	7.0	7.1	23.3	2.4	0.1	1.8
	Good	5.0	1.5	0.6	9.0	0.5	5.4
	Fair	7.0	4.0	0.4	2.4	4.7	2.1
	No Capability	78.5	86.8	75.6	84.3	92.4	90.4

E-mailing for Projects etc.	Excellent	0.6	0.3	0.0	1.0	0.0	0.6
	Very Good	5.0	5.3	23.2	1.1	0.0	0.4
	Good	2.0	0.8	0.0	2.6	0.0	1.5
	Fair	2.6	0.7	0.0	2.3	0.0	1.3
	No Capability	89.8	93.0	76.8	92.9	100.0	96.2
Internet Resources to Prepare Homework	Excellent	0.3	0.5	0.0	1.3	0.0	0.6
	Very Good	5.0	5.1	23.2	1.2	0.0	1.0
	Good	1.4	0.5	0.0	5.1	0.0	1.9
	Fair	3.8	0.6	0.0	1.7	3.4	2.3
	No Capability	89.5	93.3	76.8	90.7	96.6	94.2

**ANNEXURE – XIX**

**School Management & Students Level of skills in Intermediate  
Computer Applications**

Intermediate Applications	Level of skills	Gujarat		Karnataka	
		Government/ Public	Private	Government/ Public	Private
		%	%	%	%
Use of Applications in classroom learning	Excellent	0.0	2.0	1.2	2.1
	Very Good	22.3	13.3	4.5	4.4
	Good	0.3	5.5	7.4	6.2
	Fair	0.7	4.4	3.7	4.6
	No Capability	76.6	74.7	83.2	82.7
Use of Applications for doing assignment	Excellent	0.0	1.6	0.5	2.2
	Very Good	22.3	12.0	1.5	2.7
	Good	0.4	3.6	7.1	5.0
	Fair	0.7	4.6	2.7	2.0
	No Capability	76.7	78.2	88.2	88.2

E-mailing for Projects etc.	Excellent	0.0	0.4	0.5	1.0
	Very Good	22.3	10.4	0.5	1.0
	Good	0.0	1.3	2.4	0.8
	Fair	0.0	1.7	0.9	2.8
	No Capability	77.7	86.2	95.7	94.3
Internet Resources to Prepare Homework	Excellent	0.0	0.3	0.6	1.2
	Very Good	22.2	10.5	0.9	1.1
	Good	0.0	0.9	3.5	2.1
	Fair	0.0	2.3	1.8	2.7
	No Capability	77.7	86.1	93.1	92.9

**Gender Distribution of Students having different levels of skills in Intermediate Computer Applications**

Intermediate Applications	Level of skills	Gujarat		Karnataka	
		Boys	Girls	Boys	Girls
Use of Applications in classroom learning	Excellent	0.7	1.4	1.2	1.8
	Very Good	21.9	13.1	4.3	4.6
	Good	1.7	4.4	6.5	7.6
	Fair	1.9	3.3	3.8	4.3
	No Capability	73.8	77.8	84.2	81.8
Use of Applications for doing assignments	Excellent	0.8	0.9	0.8	1.3
	Very Good	21.7	12.0	2.1	1.7
	Good	0.9	3.2	5.8	6.9
	Fair	2.5	2.8	2.7	2.3
	No Capability	74.2	81.1	88.6	87.8

E-mailing for projects etc.	Excellent	0.3	0.1	0.5	0.8
	Very Good	21.3	10.8	0.9	0.5
	Good	0.5	0.8	0.9	2.7
	Fair	0.7	1.0	2.1	1.1
	No Capability	77.2	87.3	95.6	94.9
Use of Internet Resources	Excellent	0.2	0.1	0.6	1.0
	Very Good	21.3	10.8	1.1	0.9
	Good	0.3	0.5	2.1	3.9
	Fair	1.0	1.4	2.5	1.8
	No Capability	77.3	87.1	93.6	92.5

**ANNEXURE – XXI****Distribution of Students Having Access to the Internet**

<b>Access</b>	<b>Gujarat</b>				<b>Karnataka</b>			
	<b>Ahmedabad</b>	<b>Surat</b>	<b>Dahod</b>	<b>Total</b>	<b>Bangalore</b>	<b>Bellary</b>	<b>Mandya</b>	<b>Total</b>
Yes	10.8	1.9	2.8	4.2	18.9	9.2	13.0	12.8
No	73.5	89.7	84.1	84.0	40.9	28.3	17.3	26.9
Not Responded	15.7	8.5	13.1	11.8	40.2	62.4	69.7	60.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**ANNEXURE – XXII****Educational statistics of Karnataka**

(As on 31.03.2004)

	Primary	Secondary	Nonformal
Total number of schools	42,049	2,744	-
Enrolment totals	86,85,979	19,51,313	-
Total number of teachers	1,74,161	25,722	-
Total number of teachers trained on ICT in the past three years	1,450	15,608	
Number of Schools with access to:	-	-	
Electricity	22,000	2,438	
Telephone			
Broadband connectivity			
Number of schools with:			
Desktop computer	-	-	
Laptops	-	-	
Handhelds (PDAs)	-	-	
School Websites	-	-	
CD drives	255	1,238	
Computer speaker	255	1,238	
CD writer	190	1000	
Colour printer	-	-	
Black and white printer	255	1,238	
Laser printer	-	-	
Inkjet printer	-	-	
Dot matrix printer	251	1,238	
TV sets	1,190	1,300	
VHS player	-	-	
VCD player	-	-	
DVD player	-	-	
Video cassette player	1,190	1,300	
Audio cassette player	35,610	1,145	
Digital radio	-	-	
Photo camera	-	-	
Video camera	-	-	
Digital camera	-	-	
Cable TV connections	-	-	
Internet connection	-	800	
Overhead projector	-	1,450	
Multimedia/LCD projector	-	-	
Photocopier	-	-	
Others	-	-	

## **ANNEXURE - XXIII**

### **Educational statistics of Gujarat**

(As on 30.09.2003)

Total number of schools	: 7,641	Secondary
Enrolment totals	: 24,75,668	
Total number of teachers	: 70,064	
Total number of teachers trained on ICT in the past three years	: 2,516 (From GSEB)	
• Number of schools with access to:	:	No such statistics collected at educational level offices.
Electricity		
Telephone		
Broadband connectivity		
• Number of schools with:	:	Schools covered under State/Central sponsored Computer Education schemes – 1,618
Desktop computer		
Laptops		
Handhelds (PDAs)		
School Websites		
CD drives		
Computer speaker		
CD writer		
Colour printer		
Black & White printer		
Inkjet printer		
Dot matrix printer		
TV sets		
VHS player		
VCD player		
DVD player		
Video cassette player		
Audio cassette player		
Digital radio		
Photo camera		
Video camera		
Digital Camera		
Cable TV connections		
Internet connection		
Overhead projector		
Multimedia/LCD projector		
Photocopier		
Others		

These schools are equipped with some peripherals e.g. CD Drive, Computer Speakers etc. but no specific information regarding all these items is available.