I. Introduction: Studying ICT in Education

1.1. Statement of the thesis

This thesis deals with the integration of ICT (delimited in this study as computers and the Internet) in a private school in New Delhi. It argues for a better dialogue between pedagogy and technology; practice and research; policy, practice and theory. It seeks to understand the new epistemologies and pedagogies involved when teachers and students have new ICT tools to work with.

As technology comes to dominate and transform our lives more and more, as it becomes more pervasive, user-friendly and inexpensive, schools cannot be impervious to it. According to experts like Papert (1986), it will become an integral part of schools and eventually transform the entire process of schooling. Till then, the piecemeal efforts of the governments, multilateral agencies and school authorities can be seen as innovations and experiments that will lead them to discover the good practices and avoid some of the challenges. It also examines the reasons, rationales, policies, plans, challenges, strategies and limitations of technology integration in education.

It argues that the government formulate a robust policy of ICT in education, and ensure its effective implementation. Such policies need to prioritize empowerment of marginalized sections of society through technology, rather than marginalize them further. One way to do so is through its integration in school education. It also calls for schools to reflect on their goals and integrate technology where needed, rather than imitating the Western models of technology integration. The priorities of our developing society are different from those of the developed world, and calls for different policies and strategies. There are projects like the Hole-in-the-wall in India (described in detail in chapter 2),
which seek to provide access to slum and rural children, and have developed a new approach of ‘minimally invasive education’ (Jha and Chatterjee, 2005). There are similar projects being run in other developing countries like the computer school network in Campana, Argentina (Braslavsky, 2001) and the case of Namibia and Morocco which have evolved projects to network teacher education institutions and disseminate the constructivist paradigm and its implementation using technology with their educationists. Also, it is important to use the less expensive technologies like radio and television to reach out to the masses, and improve the quality of education, increase enrollment and retention in schools and spread adult education, as is being done in Brazil and Mexico (Chapman and Mahlick, 2004).

1.2. Organization of the thesis:

The first chapter introduces the issues involved and the school site where fieldwork was done. The second chapter deals with the theoretical underpinnings of the thesis. It details the phenomenological approach of the thesis as well as the link between technology integration and constructivism. The major issues it addresses are: the addition of ICT in the division between the haves and have-nots leading to the digital divide in the classroom; the access to ICT at home leading to better skills of middle class children; and consequently, better chances of their success in class. In continuation with the conceptual apparatus of cultural and social capital, given by Bourdieu (1986), this thesis develops the concept of “technological capital” (or tech capital). This refers to the knowledge, skills, attitudes, behaviors etc. that people develop as a result of their proficiency in ICT.

The third chapter provides a literature review. It discusses teachers’ usage and integration models; policies and practices worldwide; and a critique of ICT in education. The subsequent three chapters elaborate upon the data from the field. Chapter four describes the ICT opportunities in the school; chapter five focuses
on the teachers’ perspectives and chapter six focuses on the students. Some concluding remarks form the basis of the last chapter.

1.3. Background to the study

One of the first significant research studies done in ICT in education in India was the Computer Literacy and Studies in Schools (CLASS) project conducted by the Ministry of Human resource Development (MHRD) and the National Council of Education Research and Training (NCERT) in early the early 1990s. It was later revised by MHRD in 2002. Thereafter there have been some research surveys on the availability and usage of ICT. These have been few and far between. One significant study in this regard was by Bharadwaj (2004). He surveyed ICT provision and usage in schools across the states of Gujarat and Karnataka. The survey covered 1000 schools, more than six thousand teachers and 35,000 students. Of the thousand schools covered, 60 per cent were government schools and the remaining 40 per cent were private schools. The survey found that there were less than six computers per school and one computer for 72 students on an average. Moreover, there were even fewer schools with Internet connectivity. Only 8.6 per cent of the teachers in Gujarat and 8.8 per cent of the teachers in Karnataka had access to the Internet, whether at school or outside. And only 4.2 per cent students stated that they had access to the Internet in Gujarat, and 12.8 per cent in Karnataka. In Gujarat 79 per cent of the students surveyed could not browse or use e-Mail. In Karnataka an even larger percentage (87.3 per cent) could not browse or use e-Mail. The proportion of students who surf the Net daily was only 0.1 per cent. Also, quite significantly, 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\(^1\).

It is with the aim of filling these gaps existing in the research in ICT in education in India that this study has been undertaken. It is a qualitative study of one school, with a specific focus on the use and integration of ICT by the school, teachers, administrators and students. It delves deep into the usage of ICT at all levels, by relevant stakeholders, and examines the teaching - learning processes in detail. It seeks to analyze the processes, analyze differentials, discover trends and make suggestions for schools and policy makers.

### 1.4. Objectives of the Research

- To study the potential scope, usage and limitations of technology integration in the overall education environment, in effective practice, in institution building, and on the students' learning and overall development.
- To study the impact of technology integration in schools in the light of the debate between ‘social constructivism’ and ‘technological determinism’; and explore the relationship between technology and cultural, economic and ethical bases of society as manifest in the education sector.
- To examine the relationship between technology integration and the constructivist student centric autonomous learning environment.
- To make suggestions for further research in this area, and also for schools and policy makers.

### 1.5. Research Design: Methodology, Tools and Research Issues

The study was designed using an ethnographic perspective (see Gee & Green, 1998; Hymes, 1982). An ethnographic perspective, as opposed to a complete

\(^1\) The above figures are taken from Bharadwaj’s (2004) comprehensive study of ICT in schools across two states.
ethnography, does not focus on understanding an entire culture but rather can be used to take a more focused look at the actions of members of a group—examining "bits of life" (Bloome, 1989; Hymes, 1982). This approach is well suited to practice-oriented theories of cultural activity (1984) with a concern for understanding culture as constituted in and through the everyday practices of members of a social group (Green, Dixon, and Zaharlick, in press). According to Windschitl and Sahl (2002), the ethnographic approach to investigating socio-cultural practices is useful in revealing principles of practice that are constructed by members as they fit into roles and relationships, establish norms and expectations, and negotiate rights and obligations that constitute membership in the local group.

The fieldwork for this research was conducted in a private school in New Delhi. In 2007-08, more than a hundred thousand teachers were teaching around 3.5 Million children enrolled in 5022 schools which include 2620 Pre-primary and Primary schools, 643 Middle schools and 1759 Secondary / Senior Secondary Schools. Close to 82 per cent of Delhi’s population is literate, higher than the national average of 65. Close to 82 per cent of Delhi’s population is literate, higher than the national average of 65 per cent. There are approximately five thousand schools in Delhi. Most of these are run by various government bodies. The following table shows types of schools in Delhi:

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2 The data regarding literacy, schools and enrollment in Delhi is from the website of the Economic Survey of Delhi, 2008 Source: http://delhiplanning.nic.in/Economic%20Survey/ES2007-08/ES2007-08.htm
Table 1: Types of Schools in Delhi

<table>
<thead>
<tr>
<th>Type of School</th>
<th>Number of Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Schools</td>
<td>928</td>
</tr>
<tr>
<td>Municipal Corporation of Delhi (MCD) Schools</td>
<td>1750</td>
</tr>
<tr>
<td>New Delhi Municipal Council (NDMC) Schools</td>
<td>82</td>
</tr>
<tr>
<td>Government Aided Schools</td>
<td>221</td>
</tr>
<tr>
<td>Unaided Recognized Private Schools</td>
<td>1946</td>
</tr>
<tr>
<td>Kendriya Vidyalaya Sangathan (KVS) School</td>
<td>42</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4969</strong></td>
</tr>
</tbody>
</table>

Source: Adapted from lists of schools given at http://delhi.gov.in/wps/wcm/connect/doit_education/Education/Home/About+Us/

As the above table shows, the recognized unaided private schools in the capital city form 39 per cent of the total number of schools. These figures do not include the large number of unrecognized private schools that thrive in various parts of the city. That would take the number of private schools far higher than shown in the above table based on lists of schools provided on the website of the Directorate of Education, Government of Delhi.

The research was carried out in an unaided recognized private school in New Delhi, using various techniques - classroom observation, attending events, interviewing stakeholders, attending meetings and various activities. The Principal, teachers and students were interviewed formally using semi-structured interviews. Of the 82 teachers, 65 were interviewed. All the teachers also

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3 There are various types of schools in New Delhi. Apart from the private schools, there are government aided private schools, which receive annual aid from the government. Among government schools, some of these are run by the state government (described here as simply government schools); some are run by local bodies like Municipal Corporation of Delhi (MCD) and New Delhi Municipal Council (NDMC). Kendriya Vidyalaya Sangathan (KVS) is a government body that runs schools throughout the country, primarily for children of government employees. It needs to be mentioned that there a number of unrecognized private schools in the city, about which reliable statistics are not available.
participated in a survey. A student survey was done covering 120 students of class 9. Two focus group discussions were held with twenty students of class 9. Material from informal conversations with teachers and students were also used. The overall approach of this work is phenomenological; it seeks to see significant changes from the everyday life of the school.

The present research seeks to address the following interrelated issues:

- Understanding of technology integration as a concept and also its implementation among the various stakeholders - school principal, teachers and students.
- The effect of technology integration the school, e.g., the policy changes that a school has to make to make the technology integration effective.
- The impact of ICT on the teachers - their training, attitudes, etc.
- The impact of ICT on teaching and assessment practices, especially the creation of constructivist learning environments, if any.
- The impact of ICT on the students - their learning, motivation, activities, autonomy, attitude, aptitude, career ambitions, etc.
- Access to ICT at home and its impact in the classroom.
- Use of ICT in school administration and management.
- The factors that enable or act as barriers to technology integration
- The limitations to using technology in education

A private school was deliberately selected for this study, as most of the government schools do not have adequate technology infrastructure or other facilities associated with technology integration. Another reason is the increasing enrollment in private schools. As several studies point out, [Kingdon (1996), PROBE Reports (1999 to 2011), De et al (2001), Tooley and Dixon (2003), and Mehta (2005)], there is reason to believe that private fee-charging schools increasingly cater to a substantial fraction of the primary-school going population.
in India (Murlidahran & Kramer, 2006). Kingdon (2007) shows that the enrollment in private schools is growing rapidly. According to her:

‘In the 9-year period 1993–2002, government and aided primary schools together absorbed only 4.3 per cent of the total urban increase in primary school enrolments, i.e. their numbers or enrolments grew very slowly. Nearly 96 per cent of the total increase in urban primary enrolment was due to the growth of private schooling! It bears emphasizing that even this dramatic statistic is an underestimate since it takes no account of enrolment growth in the numerous unrecognized private schools that are excluded from official statistics...The expansion of private schooling and its use by the poor suggests, at least in part, that parents perceive its quality to be better than that of public education. The growth of private schooling also suggests growing inequality in terms of access to quality education.’ (Kingdon, 2007: 186)

Further evidence comes from the ASER survey (Pratham, 2011) which shows that private school enrollment for rural children in the age group 6 to 14 has increased from 21.8 per cent in 2009 to 24.3 per cent in 2010. This number has risen steadily since 2005 when it was 16.3 per cent nationally. (Pratham, 2011: 51). One of the key reasons for the recent increase in enrollment in private schools is the popular perception that the quality of education is better in private schools. These high enrollment rates in private schools also partially explain why, despite falling or virtually static per-capita public education expenditure in several Indian states and falling share of basic education expenditure in state domestic product (Dreze and Sen, 2002). Thus, private schools have come to occupy an important place in the education scenario in the country.

The following criteria were developed for the selection of the school for fieldwork:

- The school should have some technology infrastructure
- It should aim to integrate technology effectively
- Its teachers should have received some training in technology skills
- Its students should have some exposure to technology
- It should not be a government school, nor a private school run by a religious trust or for a particular ethnic / religious group etc.
- The school should not be regarded as an elite school, rather it should have a middle middle class clientele

Kirtimaan School was selected for fieldwork as it satisfies all of the above criteria. It lies between these two extremes of under-equipped government schools and elite private schools that are flush with infrastructure. Also, it was considered important that the school clientele be middle class. In their study of private schooling in Delhi, Bhatia and Seth (1975) found that different types of private schools could be grouped in terms of the income of the pupils' fathers. Bhatia and Seth concluded that economic status of parents is a significant determinant of school selection, and this was true of both aided and unaided private schools. Thus, selection of this school implies the selection of a student base largely from middle middle class homes.

1.6. About the School under Study

Kirtimaan School, New Delhi, is managed by an education foundation, which is engaged in the management of several schools and a couple of undergraduate colleges in Delhi. The foundation was established in early 20th century by a retired judge. According to the website of this foundation, it stands for ‘serving the cause of education without any commercial motive’. Later, the founder

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4 A pseudonym has been used to protect the identity of the school. Names of the teachers have also been changed to ensure anonymity.

5 That these students belong to middle middle class homes is also borne out by the profile of students provided in chapter 6.
donated all his belongings to this foundation. His family members take active part in the running of this foundation and the schools and colleges even today.

Kirtimaan School is a full fledged three section (primary, middle and senior) school. Established in 1974, the school has a large campus spread over six acres, with a spacious building and sports grounds. The school has a Chemistry Lab, a Physics Lab, a Biology Lab, a Maths Lab and 2 Computer Labs. According to the school website,

“We are very consciously gearing ourselves to face the next millennium for the children with us today will be adults in a very different world and we need to prepare them for it. The need to develop an open, flexible, interdisciplinary and global curriculum has never been greater. Keeping this in mind we review our school programme periodically and incorporate these learning skills. We create as many opportunities as possible for this growth because for us each child who enters this school is somebody very-very special and that is the very essence and philosophy of this school.” (School website, emphasis original)

This school was selected as the site for fieldwork as it fulfills the criteria mentioned above. It is a representative of an average middle class English medium private school in the capital. It has a good ICT infrastructure representative of most schools in its class. It scores above other schools in its class in terms of teacher training and ICT integration being a significant goal for the school. Also, it has a dynamic principal who is behind this positive thrust being given to ICT. While the school is known for its dynamic principal, excellence approach to academics, it is also associated with good practices of ICT integration. The school principal, administrative staff, teachers, librarians, lab technicians and students all use ICT in various ways to enhance the teaching / learning experience.
The location of the school is significant. It is located in a colony in South Delhi. This is a large colony of housing that the government provides to its employees. The colony residents belong to middle and lower levels of government employees. Most of the residents of the colony are in the clerical cadre, and some are officers. There is a MCD Primary School that is right opposite to this school, and the school is known to conduct some of its welfare activities in this school. There is another government school in the vicinity, as is a small market and a community centre. Some of the students of the school are children of government employees and live in this colony or other nearby government colonies.

The school itself is a building with two floors, resembling a traditional Indian home, with rooms on all four sides and a lawn in the middle. The entrance is lined on both sides by rows of imposing palm trees. The Schools’ Principal’s office, administrative and finance departments and staff room form a small single storey block that lies before the main school building. On one side is the Nursery wing and its small playground with swings and other equipment for play. The Science Park now is next to the nursery playground. Behind the main school building is a large playground for sports like football, cricket, volley ball, and athletics. Many of the school functions are held here.

At the time of fieldwork, the school had a population of 82 teachers and 1800 students. There were only five male teachers, and all the others were women. Among the students, there were 1080 boys (60 per cent) and 720 girls (40 per cent). The students wear blue uniforms – light blue shirts and dark blue trousers with black shoes. While the boys wear their uniform in western style – with the shirt tucked into the trousers at the waist, the girls’ shirts are more in the indo-western style. Their shirts are longer and styled like short kurtas (shirts), and not tucked into their trousers. The teachers wear traditional formal dresses like salwar-kameez and sarees. They do not wear western style dresses.
Thus, the school has an overall middle class ambience, which is evident from some of the details given above. It is also sought to bring forth this fact through the profiles of teachers and students as part of Chapters 5 and 6 respectively. It was selected precisely because it caters to teachers and students from middle class backgrounds. The rationale behind such a selection is that many of the teachers and students have access to computers / internet at home, while some of them do not enjoy such access. It is the dynamics between those who have access, and those who do not that forms an important part of this thesis.