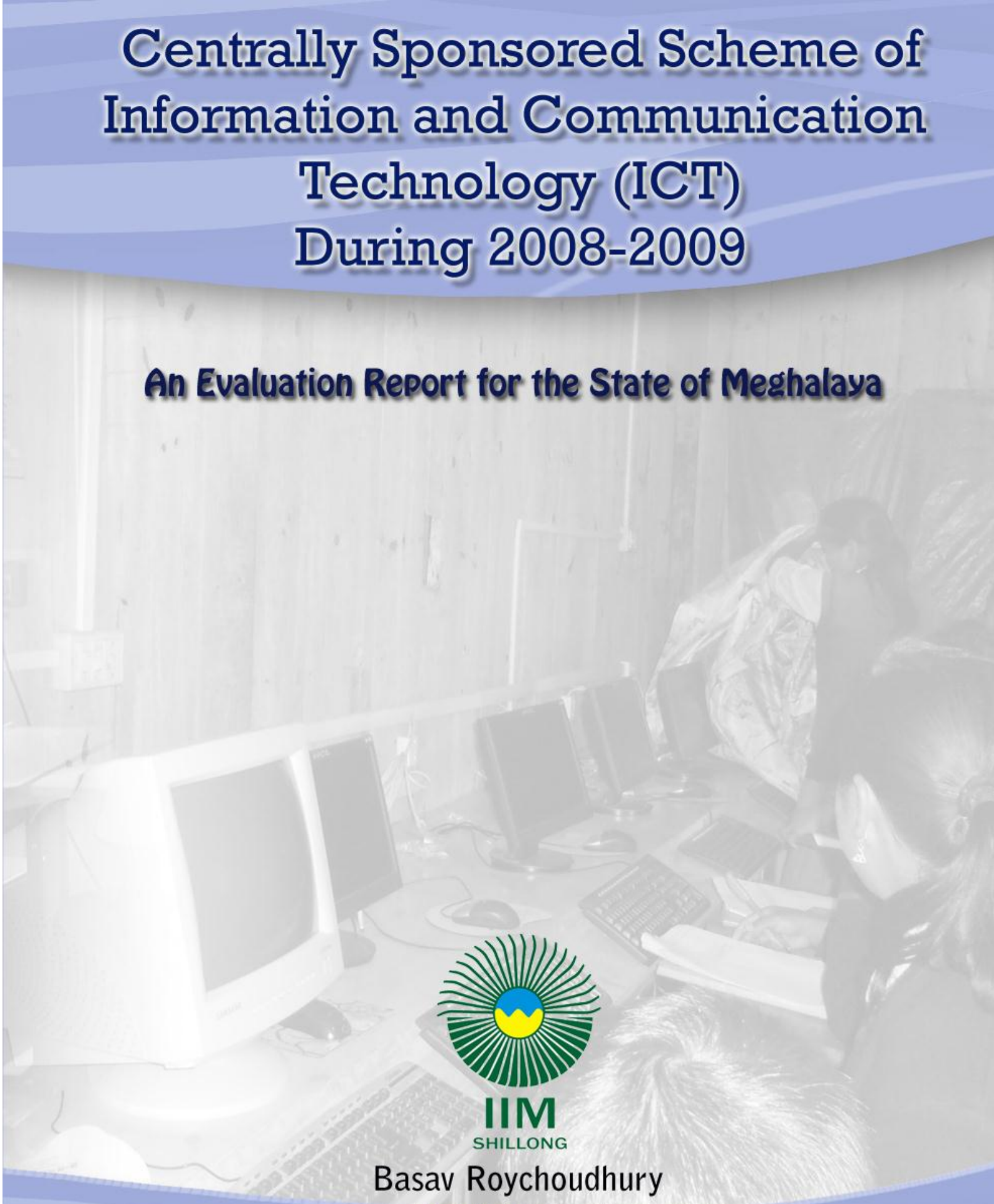
Centrally Sponsored Scheme of Information and Communication Technology (ICT) During 2008-2009

An Evaluation Report for the State of Meghalaya



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Organization of this Report

The first chapter - ***Introduction*** – puts forth the goals that are laid forward by United Nations and UNESCO towards improving social and economic conditions of the world's poor. Education has been put forward as one of the interventions towards that. These get drawn from the 'Millennium Development Goals' of United Nations and 'Education for All' of UNESCO. This chapter details out these goals and puts into perspective the role of ICT in providing the necessary access and make the same more relevant.

The second chapter – ***ICT – Change Agent for Holistic Education*** – discusses the reality of the new age disparity and advocates an agenda for a holistic education. It points out that ICT can be the necessary change agent and lists out certain experiences from other countries like Bolivia, Netherlands, Jamaica, the Middle East, Afghanistan and Bangladesh. The chapter ends with a discussion on the ICT initiatives undertaken across various parts of India towards enhancing quality of education.

The third chapter – ***ICT@Schools Scheme – Implementation in Meghalaya*** – puts the ICT@Schools scheme in perspective vis-à-vis the state of Meghalaya. The chapter begins with a glimpse of unique social, cultural, and political scenario of the state. It then goes ahead detailing the terms and reference of implementation by the agency entrusted for the same, the infrastructure requirements, the distribution of schools selected for the first phase, and the status of implementation compared to the guidelines of the said scheme.

The fourth chapter – ***Framework for Evaluation*** – builds up a case for using a Balance Score Card approach of presenting the evaluation results. Towards this, the chapter conceptualizes the evaluation process and develops the key performance measures in terms of variables classified as facilitators, enablers and outcomes. It is endeavored to capture the experiences of the implementation of the ICT@Schools scheme in the state of Meghalaya in terms of the key performance measures quantified in the form of these variables.

The fifth chapter – ***The Surveyors' Impression*** – narrates the experiences of the surveyors' as they visited the schools across the state. This chapter vividly captures the ethos of the scheme

implementation at various schools. It brings out the challenges faced by the students as well as the schools as they together try to integrate ICT into their curriculum.

The sixth chapter – ***Data Analysis and Observation*** – brings out the status of the schools with reference to the various parameters that this survey tried to evaluate. For the convenience of comparison, the districts of the state have been clubbed into three area clusters. This chapter provides a glimpse of the schools which have been the beneficiaries of first phase implementation of the scheme – in terms of their infrastructure, their administration and the access to ICT that they have been able to provide to their student.

The seventh chapter – ***Balance Score Card of ICT@75 Schools in Meghalaya*** – classifies the beneficiary schools in terms of the indices developed in chapter four, and categorizes them in terms of above average, average and below average. The chapter ends with final grouping of the schools in terms of their overall performance.

The eighth chapter – ***Content Analysis of Learning Materials*** – discusses the content of the six CDs provided by the implementing agency to all these schools. The CDs are analyzed in terms of their coverage of curriculum as well as the possible features expected in ICT enabled pedagogy.

The ninth chapter – ***Some Suggestions on Going Forward*** – puts forwards certain suggestions to make the implementation of the scheme more effective. The chapter discusses the technical, behavioral and operational issues towards implementation of the scheme which has the potential to provide the children of this country with a richer educational experience.

Chapter nine is followed by a series of appendices. ***Appendix 1*** provides the balance score card for all the beneficiary schools. The listing is ordered according to performance as well as in terms of the location of these schools. ***Appendix 2*** provides the cross-tabulation of data in terms of various indices and classifies the performance of the schools across different area clusters. ***Appendix 3*** provides the plots based on the data provided in the previous appendix. ***Appendix 4*** once again provided the cross tabulation of data in terms of the defined indices and classifies the performance of the schools, this time across the districts of the state of Meghalaya. ***Appendix 5*** presents the plots based on the data of the previous appendix. The correlation across the various indices is provided in ***Appendix 6***. ***Appendix 7*** contains the sample of all the different questionnaires used in this evaluation study.

Chapter 1
Introduction

The Digital Divide (information, knowledge and computer literacy gaps between people of different socio-demographic groups) has created material, social, technological and educational inequalities in the system. Education, therefore, has a pivotal role to play in changing mindsets and imparting skills which will result in this divide being bridged over time.

1.1. Millennium Development Goals and UNESCO 'Education for All' Goals vis-à-vis ICT Education

The guiding lights towards ushering in ICT education at different levels are the United Nations' Millennium Development Goals and the UNESCO 'Education for All' Goals. These goals are as follows:

The *Millennium Development Goals* (MDGs) are eight international development goals that all 192 United Nations member states and at least 23 international organizations have agreed to achieve by the year 2015. The aim of the Millennium Development Goals (MDGs) is to encourage development by improving social and economic conditions in the world's poorest countries. They derive from earlier international development targets and were officially established following the Millennium Summit in 2000, where all world leaders present adopted the United Nations Millennium Declaration, from which the eight goals were derived. The Declaration asserts that every individual has the right to dignity, freedom, equality and a basic standard of living. The MDGs were made to operationalize these ideas by setting targets and indicators for poverty reduction on a fifteen-year timeline. The MDGs, as related to Education are as below:

Goal 2: Achieve Universal Primary Education

> Target 3. Ensure that by 2015, children everywhere, boys and girls alike, will be able to complete a full course of schooling.

Goal 3: Promote Gender Equality and Empower Women

> Target 4. Eliminate gender disparity in primary and secondary education, preferably by 2005, and to all levels of education no later than 2015.

Another initiative by UNESCO - Education for All - is a global movement aimed to meet the learning needs of all children, youth and adults by 2015. They also contribute to the global pursuit of the MDGs. The Education for All (EFA) Goals (From the Dakar Framework for Action) are as follows:

Goal 1: Early childhood care and education

> Expanding and Improving comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children;

Goal 2: Universal Primary Education

> Ensuring that by 2015, all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to and complete free and compulsory primary education of good quality;

Goal 3: Learning needs of all young people and adults

> Ensuring that the learning needs of all young people and adults are met through equitable access to appropriate learning and life skills programs;

Goal 4: Adult Literacy

> Achieving a 50% improvement in levels of adult literacy by 2015, especially for women, and equitable access to basic and continuing education for all adults;

Goal 5: Gender Equality

> Eliminating gender disparities in primary and secondary education by 2005, and achieving gender equality in education by 2015, with a focus on ensuring girls' full and equal access to and achievement in basic education of good quality;

Goal 6: Education equality

> Improving all aspects of the quality of education and ensuring excellence of all so that recognized and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills.

Keeping in mind the above goals, the emergence of Information and Communication Technology (ICT) – computers, internet, multimedia, etc. with all the hardware and corresponding software –

provides a huge opportunity for promoting education en-masse, especially in developing nations. ICT helps promote learning and enhances knowledge. It helps create an enabling environment with huge potentials.

The Global Knowledge Economy has caused a knowledge explosion in the world. The application of new technologies has empowered people with the possibility for lifelong learning. The demand of the labor market throughout the world has now transformed and new knowledge and skills are therefore called for. Fundamental changes are now needed to address these transformations. Learner-Centric and Lifelong learning is the need of the hour. An appropriate skill base is required especially in developing countries.

In this scenario, ICT can make education more relevant and accessible. It can create opportunities for developing countries to enhance educational systems and policies and reduce economic disparity. ICT can contribute in formal or informal settings, scattered and rural populations and can reach out to ethnic minorities. It can also benefit females, the elderly and people with disabilities. It transcends time and space and is therefore applicable and relevant to most time schedules across vast distances.

ICT thus, helps prepare the young student for a technological workplace and hence creates a skill base to help the child compete in a competitive and global job market.

Some Critical Skills required for the future Workplace include: (Source: V L Tinio, ICT in Education)

- *Digital Age Literacy*

  This includes *Functional Literacy* (using images and charts to decipher meaning and express ideas), *Scientific Literacy* (understanding theoretical and applied science and mathematics), *Technological Literacy* (competence in the use of ICT), Information Literacy(Ability to find, evaluate and use information), *Cultural Literacy* (Appreciation of Cultural Diversity) and *Global Awareness* (Understanding the relationships across nations and communities).

- *Inventive Thinking*

  This includes Adaptability, Curiosity, Creativity, Risk-taking, problem Solving and Logical thinking.

- *Effective Communication*

  This includes Ability to work in a team, Interpersonal skills and Personal and Social Responsibility

In order to acquire the above skills and become capable of dealing with an ever changing work environment, it has become imperative to integrate ICT in the lives of young students who can then compete in the workplace of the future.

ICT helps in improving the quality of education by motivating learners and engaging them. This leads to a learner-centric environment. Multimedia which combine text, sound and images along with interactive learning methods like songs and skits facilitate learning greatly. Activities and pace determined by small learning groups who demonstrate teamwork and creative problem solving are the processes of the information age learning. Integrating theory and practice, inter-relationships and understanding of themes dictate the new learning era.

Chapter 2

ICT - Change Agent for Holistic Education

This chapter aims to introduce Information and Communication Technology (ICT) and the initiatives taken in the ICT domain on a Global and National basis. The central theme is to highlight ICT as an enabler which also empowers students through computer-aided learning in schools and thereby acts as a change agent for holistic education.

2.1. The New Age Disparity

Initially, due to the material and social disparity amongst people, only few people had access to the information and goods available. This created a situation where certain people developed more in the material, educational and social domains. As this continued, those who had the knowledge to use technology and look for information along with the necessary means could access and avail of the opportunities while the others lagged behind. This created greater disparities.

Thus, there were the *Information Haves* and *Information Have-Nots*. This led to unequal access and use of the new media in terms of power and availability. As Information and Technology became critical, only few had the access and knowledge to use the tools to access and organize learning and information while others could not. This led to certain sections having exclusive power and access leading to the formation of an information and knowledge gulf or divide thereby creating a lack of equality – the *Digital Divide* was born.

Amartya Sen (1992) asked – 'Equality of What?' This question led to the breakup of the inequality into technological (opportunity), immaterial (freedom), material (capital), social (position, power) and educational (capability, skill) inequalities. A further breakup led to the description of various forms of access to technology such as motivational, material, skills and usage access (Dijk, 2005). These disparities led to the need for a system which could bridge this divide.

2.2. An Agenda for a Holistic System of Education

The need of the hour is to strengthen a system of education using systemic changes in tune with curricula reforms based on values such as social justice and equality. A holistic approach is required for inclusive learning. Learner Engagement, Curiosity and Creativity are to be encouraged. Experiential learning – observing, exploring, discovering, analyzing and critically reflecting are as important as knowledge content. Subjects like mathematics should enhance the child's ability to think and reason, to visualize and handle abstractions, to formulate and solve problems; Science should engage the student in acquiring methods and processes that nurtures curiosity and creativity particularly in relation to the environment; Social Sciences should focus on conceptual understanding rather than rote learning and should equip the child to think independently and reflect critically on social issues; history should be recast as a shaping influence on the child's conception of the past. The role of the teacher is to enable students to discover their talents, to realize their physical and intellectual potential to the fullest, to develop character and desirable social and human values to function as responsible citizens. (National Curriculum Framework 2005, NCERT)

Lifelong learning is a critical need today. It can be defined as a process of accomplishing personal, social and professional development throughout the life-span of individuals in order to enhance the quality of life of both individuals and their collectives (Dave, 1976).

2.3. ICT as a Change Agent

ICT as a change agent was recognized as having the potential to reform the system. However, the mere availability of computers does not impact student learning. ICT should be used along with student centered pedagogy. Policy makers need to think in terms of combinations of input factors that can work together to influence learning. Coordinating the introduction of computers with national policies related to curriculum, pedagogy, assessment and teacher training will have greater impact. Various impacts of ICT, such as Impact on learning of school subjects, impact beyond the curriculum such as enhanced motivation and a positive attitude, impact on diverse students through enhanced self-esteem and learning autonomy, impact on teacher skills and motivation, impact on classroom practice and impact on schools and communities are certain areas where ICT can contribute. This is also consistent with the MDGs (Kozma).

Three main approaches to ICT as Change Agent (Cox et al, 2004) by the teachers include:

1. the enhancement of particular concepts and skills
2. using an ICT resource to enhance the existing topic
3. using an ICT resource to empower student learning.

Presenting knowledge in new and challenging ways and freeing the student from repetitive tasks enhances learning (Kemmis et al, 1977). Evoh (2007) proclaimed ICT as one of the most powerful educational reforms tools to achieve the 'Education for All' goals of the UN.

But, there are certain barriers to ICT also. These include teacher and administrator attitudes and beliefs, ineffective leadership, traditional structure and insensitivity to local cultures. (Hew et al, 2007). Also a rigid hierarchy and teacher isolation are hindrances (Williams et al, 2008). School principals should therefore be better informed of teachers' perceptions. (Wong, 2006) Educationists should take this view into account when developing curriculum (Juang et al, 2008)

In terms of teaching-learning process quality in education, India has a pyramid structure with most of the schools at the bottom. It is here that ICT can make a huge difference and permeate the gaps between different sections of the pyramid by standardization and ease of application.

2.4. Some successful ICT initiatives in the World

2.4.1. Bolivia

NGO's have developed a large collection of ethnographic materials comprising important indigenous knowledge about culture and economic practices in Bolivia. Using modern interactive multimedia applications, they develop educational materials for primary and secondary schools for subjects like history, geography, culture and languages.

This award winning project began in 2000 when the project owner, a local NGO called *Apoyo Para el Campesino-Indígena del Oriente Boliviano* (APCOB) developed a collection of multimedia modules for basic, secondary and teacher training. The first module was about the indigenous Ayoreos people. The modules were tested and introduced in four secondary schools in Santa Cruz along with a training program for teachers and students. Since then, financial support has been sought through MOUs with regional educational authorities, lobbying at national level for integration of the materials with national curricula and a proposal to the Ministry of Education for funding as part of the ICT policy (IICD, 2010).

2.4.2. Netherlands

Since its inception in 1999, the *Global Teenager Project* (GTP) initiated by *International Institute for Communication and Development* (IICD) in the Netherlands has grown from 3 classes to over 350. A rapidly expanding virtual network of schools in both the developing and developed world and an upcoming generation of information-literate, knowledge-oriented, culturally-aware global citizens is the result.

GTP, offers basic, thematic and over 80 special Learning Circles per year using wikis and email (ICT-enriched virtual learning in a global context through a team effort resulting from the co-operation between teachers and students) to elementary, secondary and vocational classes including special needs education. GTP currently includes 34 participating countries and offers collaborative global learning to over 15.000 students per year (IICD, 2010).

2.4.3. Jamaica

The *Jamaica* Collaborate for Universal Technology Education (JCUTE) Initiative launched in 2006 is a joint initiative of IECF and ICT4D Jamaica. It is a collaboration of organizations from the public and private sector, civil society and the international community and aims to initiate a universal technology education program driven by Public-Private Partnership (PPP). It is hoped to help the students graduate with 21st century skill sets by providing sustainable support for education transformation through an organized teacher development system. To date, support for the PPP agenda has been granted by the Ministry of Education, Ministry of Commerce, and a significant cross-section of the private sector to the tune of JA $1M.(IICD, 2010)

2.4.4. Middle East

At the *Global Campus*, e-knowledge offers kids innovative content through cartoon characters. The exotic cartoons deliver educational material in a way understood and enjoyed by young children. Educational interactive games with voice over narration in English and Arabic, vibrant colors and motivational songs are presented in a series form. E-hobbies are encouraged. (ITU, UN)

2.4.5. New Zealand

The *Tech Angels* came to the rescue when the technological needs of the Wellington Girls College could not be met by the available staff. In a unique manner some children came forward to teach the teachers in the use of ICT. Launched in 2003 and sponsored by the Ministry of Education, students are now trained professionally and in turn train the staff. Hence the problem of the shortage of skilled teachers is met with through educating the existing people. Each tech angel mentors two teachers, teaching topics ranging from general use of the computer through to scanning , movie editing and burning CDs to name a few. (ITU, UN)

2.4.6. Afghanistan

Proper teacher training has been ushered in through *Microsoft Unlimited Potential Program,* which follows a *Train the Trainer* Model to provide computer skills to the lowest strata of society. The necessary infrastructure and support is provided by *Danish International Development Agency*. The

One Laptop Per Child (OLPC) project has provided 5000 XO laptops to students as well as local language software.

As for ICT in Non-Formal Education (NFE), *Multipurpose Community Tele-Centers* (MCT) were setup, whereby Post Offices in 12 provinces were upgraded to offer ICT services such as computers, printers, modems, etc. Educational Radio and Television was established to raise public awareness. The *Afghan School of Learning* initiates programs for Women.

2.4.7. Bangladesh

Bangladesh Rural Advancement Committee (BRAC) helps teachers to familiarize themselves with ICT and improve skills. Relief International and Schools Online (RI-SOL), Intel Corporation, and the U.S. State Department Educational and Cultural Affairs Bureau (ECA) collaborate to provide ICT training.

In addition, BRAC provide ICT enhanced learning material following national curriculum. They also introduced 17 mobile ICT labs containing laptops, projectors and cameras for schools in remote areas. RI-SOL launched 47 learning centers offering online communication tools.

For ICT in Non-Formal Education (NFE), *Gonokendros* (Union Libraries) were introduced by BRAC to provided computer training for children at low cost. *Grameen* Communications launched the *Village Computer and Internet Project* to empower the rural community with ICT.

2.5. Some successful ICT Implementation in India

In Delhi, *Project Sharada* is an innovative approach to bring students to school by using ICTs for facilitative learning and increasing interest and motivation. Run by the Municipal Corporation Department, Delhi, it addressed low retentions, enrollment, disinterest in education and absenteeism in the urban poor community. More than 487 computer learning centers have been made possible with 500 education volunteers and 2,500 PCs under Linux OS. This provides under-privileged communities with equal opportunity.

In Khammam District of Andhra Pradesh, the *Giri Pragna* Project has been successful for providing opportunities to tribals. 50 school complexes covering classes 6 to 10 and 10,000 children every year are exposed to computer-aided learning. The latest technology and syllabus is used. Special CDs are designed in local language. Teacher training is also a prime focus.

In Kerala, the ICT@school project has enhanced the productivity of teachers and students in over 8000 schools in the State. It has a strong network of 200 master teachers and 5600 school IT coordinators who are handpicked from amongst the school teachers. The program is fully integrated into the existing school educational processes and trains school teachers. At least 1.1 lakh teachers

have been trained. The focus of the training has moved over the years from IT to using IT for other subjects.

In content development there is the free operating system - GNU/Linux - which is bundled with educational software like Dr. Geo, Rasmol, K-Tech lab, Kalcium, etc. All these packages are being extensively customized by the teachers themselves for facilitating complete ICT enabled education in the state. The Project has prepared interactive multimedia CDs, Handbooks & Training modules for ICT as well as Text books for IT in standard 5 to 10. The developed content is as per National Curriculum Framework.

The project has shown considerable success. It has resulted in higher level of teacher engagement, integration of computer learning with regular learning processes and development of teacher networks and collaborative content creation processes. All of these support teacher professional development and have led to a stronger education system and better learning outcomes.

Intel Teach Program has reached more than 5,70,000 teachers across 14 states. It helps in providing pre-service and in-service teacher training to help integrate technology in the classroom. Microsoft – 'Project Shiksha' was also launched to instill ICT awareness amongst teachers.

Hole in the Wall Education Limited (HiWEL), a cooperative effort between NIIT and the International Finance Corporation (IFC) installed computer kiosks in urban slums. 'Namma Dhwani' was India's first cable audio initiative. It transmits information to schools and individual homes. *Planet Read* initiated 'Literacy for a Billion' using subtitles on song based programs.

The National Policy on Education (NPE) was released in 1986 amended 1992 with the Program of Action (POA) on NPE stressing the need to improve the access to computers in schools. Further the working group on Elementary and Adult Education for the 10th Five Year Plan (2002-2007) recommended that one or two schools in every cluster in the country should have facilities for computer based learning which can be used by children in adjoining schools. In 2004, the Department of Education released a draft scheme for ICT in schools for computer-aided learning.

2.6. National Programs launched by government of India to promote ICT at the school level

2.6.1. Sarva Shiksha Abhiyan (SSA)

SSA is a flagship program of the Government of India to achieve universalization of Elementary Education as mandated by 86th Amendment to the Constitution of India making free and compulsory education to children aged between 6 and 14 years a fundamental right. SSA is implemented in partnership with State Governments. It has an innovative component for girl education, early childhood care and education, interventions for children belonging to scheduled

tribes and community computer education especially in the upper primary school level. SSA aims to create computer awareness and literacy and empower students through computer-aided learning.

2.6.2. Gyan Darshan

Doordarshan's educational channel, Gyan Darshan was launched in January, 2000 in partnership with Ministry of HRD and IGNOU. This channel provides curriculum based programs in the areas of primary, secondary, higher, distance, technical and vocational education. Gyan Darshan 1 is the main channel and includes country wide classroom programs. Gyan Darshan 2 and The Training and Development Communication Channel (TDCC) are one-way video and two-way audio satellite based interactive systems for distance education. Gyan Darshan 3 is for technical education.

2.6.3. Gyan Vani

In November 2001, an FM radio channel called GyanVani was launched. The channel serves to address local educational, development and socio-cultural requirements. The programs are broadcast in English, Hindi and regional languages.

2.6.4. EDUSAT

EDUSAT is the first Indian satellite for the Educational Sector and was launched in September, 2004 by ISRO. Although meant for school and college level education it also supports non-formal education.

2.6.5. ICT @ Schools

The Scheme of Information Technology and Communication (ICT) @ Schools was introduced by the Govt. of India in 2009. The scheme provided 10 computers, scanners, printers, educational software, etc. to introduce and promote computer literacy also across 75 schools in the country. 75 schools of Meghalaya, as of date, are also the beneficiaries of this project.

The reason for introducing the scheme was to address the huge disparity in India in Information Technology (IT). The ICT scheme therefore proposed to open new vistas of learning and bridge the socioeconomic and geographic divide across the country with respect to Information Technology and provide a level playing field to rural as well as metropolitan students.

Some objectives of the scheme are listed below:

- To establish an enabling environment to promote the usage of ICT especially in rural areas including availability of access devices, internet connectivity and ICT literacy promotion.
- To make quality on-line content available both in the private sector and by the *State Institute of Educational Technology* (SIET)s.

- To enrich the existing curriculum and pedagogy by employing ICT tools for teaching and learning.

- To transfer skills to students to enable them to go for higher studies and also to build skills that make them employable.

- To provide a facilitating learning environment for special needs children.

- To promote critical and analytical thinking in students and to thereby move to self-initiated student-centric learning. To promote self-learning and lifelong learning and to build a spirit of inquiry in the students.

- To promote ICT tools in distance education to allow for learning across vast distances including audio-visual medium and satellite-based devices.

The State Governments and Union Territories administration joined hands to provide computer-aided education to Secondary and Higher-Secondary Government Schools. They were free to partner with private organizations or integrate with other schemes. Kendriya Vidyalaya Sangathan, Navodaya Vidyalaya Samiti and the State Institutes of Education were also the implementation partners. The National Council for Teachers Education was associated for training of teachers in computer-aided learning. The Rehabilitation Council of India was to play an important role in introducing technology to children with special needs.

The salient features of this scheme are:

1. The Government of India and the State Governments/UT sponsored the scheme in the ratio of 75:25 respectively in the case of all States/UT, and in the case of special category States this ratio was 90:10. The maximum limit for the implementation cost was Rs. 6.7 lacs and recurring costs were Rs. 1.34 lacs per school.

2. The scheme plan envisaged the establishment of SMART schools in each state who would be technology demonstrators. They were required to have at least 40 computers. These schools would act as role models not just in computer literacy but also act as the benchmark for demonstration of Values and Skills for the next millennium. Kendriya Vidyalaya Sangathan (KVS) and Navodaya Vidyalaya Samiti (NVS) were given the responsibility of converting one school per state into a SMART school. A grant of up to Rs. 25 lacs was provisioned per SMART school with a recurring cost provision of Rs. 2.5 lacs.

3. Content Development was envisaged to be institutionalized through the National Education Portal. Also, KVS and NVS would be given Rs. 20,000 per neighbourhood school to impart computer literacy to up to 10 schools within a radius of 4 kms and to cover 8000 schools over 3 years. The course can be imparted in local language if required.

4. Central Institute of Education Technology (CIET) and State Institutes of Education Technology (SIET) were required to assess the need for and produce audio, video and multimedia programs. They needed to prepare the profile of target groups and train state level personnel. They would also be required to train teachers and teacher trainers in low cost audio-visual aids production, script development, media production, communication research and setting up and operating of audio and video studios. Computerization of various processes was also required. They then needed to feed telecast and broadcast service titled Tarang and Umang on DD-1 and AIR and also the dedicated education channels – GyanDarshan and GyanVani. CIET is to coordinate the academic production and technical activities of the 6 SIET's.

5. Educational film festivals and multimedia contests were to be organized periodically. The States/UT would get financial start based on their Computer Education Plans (CEPs). National awards would be established and conferred for development and use of ICT tools.

6. Special need children would need introduction to the use of technology and there would be projects for that purpose.

7. SIETs can sell audio-video programs. They can give their studios for lease or hire.

8. Each State/UT needed to form a Computer Education Plan (CEP). This entailed details like number of schools to be covered, number of beneficiary students, short list of vendors and at least 2 schools from the Educationally Backward Block.

9. Funds would be allocated to KVS/NVS for SMART schools and Universalization of Computer Literacy. The Department of IT would make available infrastructure resources and expertise to provide internet connectivity in schools.

10. A Project Monitoring and Evaluation Group headed by the Secretary (Secondary and Higher Education) would consider the CEPs. After selection, progress reports would be required every quarter.

Hence, ICT is recognized as a change agent and it is envisaged that it will bring huge transformation in the system.

2.7. ICT in India – Challenges and Solutions

ICT in India is fraught with Challenges relating to

- *Infrastructure* like Power, Operating system anomalies and lack of a common Standard
- *Capacity building* like lack of trained faculty, resistance to change and lack of awareness

- *E-content* like Delivery and Quality Procurement
- *Teaching-Learning Processes* including quality in delivery and processes
- *Public-Private Partnerships* like effective building and usage
- *Monitoring and Evaluation* like understanding how this encourages introspection and promotes dialogue among stakeholders for improving learning outcomes.

Possible Solutions for

- *Infrastructure* are monthly maintenance, training of local people and parents, creating a digital library on the LAN, PC-Projectors in all classrooms
- *Capacity Building* are teacher training to change attitudes and upgrade skill, creation of student clubs and inclusion of creative tools like Photoshop and open source software
- *E-content* are Interactive Radio Instructions and EDUSAT, hole-in-the wall projects and computer manuals in various languages
- *Teaching-Learning Processes* are developing a culture of facilitation versus teaching, authenticated content, courseware, videos and virtual worlds depicting real-life experiences and picture stories
- *Public-Private Partnerships* area fair and transparent public system with schools offering vocational training in post-school hours, offering certifications, scholarships and placements
- *Monitoring and Evaluation* are Result based Monitoring, diverse evaluation team, understanding and evaluation of issues and examination of ICT synchronization with current teaching methods. (GeSCI, 2007)

ICT is therefore an essential Change Agent that can transform the Education Landscape. Hence, all the stakeholders need to look at the challenges and gear up to look for practical and feasible solutions such that ICT can quickly be integrated into the fabric of our society and create the platform for holistic education.

Chapter 3

ICT @ Schools Scheme - Implementation in Meghalaya

The current evaluation study envisages understanding the level of implementation – the successes and challenges – of the *ICT@schools scheme* (discussed in section 1.4.5) in the State of Meghalaya. The scheme has been implemented in the State since last one year in 75 different schools. This study is an attempt to understand and document the experiences in these 75 schools and to look at future implementations based on these experiences.

Going with the national initiative for providing a level playing field to school students - whether in rural areas or in the metropolitan cities, especially in the area of digital divide – the state of Meghalaya has also partnered with the Central government to take ICT education to the remotest parts of the state. For this purpose, seventy five (75) schools were selected in the first phase for implementation of ICT @ Schools scheme in the state. In going by the spirit of the scheme, the majority of the schools selected are from the rural areas.

3.1. Meghalaya –The Context

Meghalaya is situated in the north eastern part of India, where it is bordered by two regions, on the north and east by Assam and on the south and west by Bangladesh. It is one of the seven sister's state of the north east India. Meghalaya is known as the *Scotland of the East* because of its scenic beauty. Since the hills are mostly covered with clouds and fogs during the rainy season, therefore it is called as *abode of the clouds*.

Meghalaya has many things bestow with it, be it a rich cultural heritage, misty heights, luxurious vegetation, flora and fauna, it becomes a source of inspiration to any poet, a dramatic canvas for an artist's dream, and the ideal retreat for people in search of beauty and solitude. Meghalaya being

the hill station is one of the most picturesque states of India, offering a spectrum of sylvan surroundings.

Geographically the greatest portion of the state has a dangerously steep facing the south plateau. The Garos in the west, Khasis in the centre and the Jaintias in the east are the three dominant tribes which inhabits the Meghalaya plateau. Meghalaya is divided into seven districts, viz. East Khasi Hills, West Khasi Hills, Jaintia Hills, Ri-Bhoi, East Garo Hills, West Garo Hills and South Garo Hills.

Table 3.1-Districts and its Headquarters

Sl.No.	District	Headquater
1	East Khasi Hills	Shillong[1]
2	West Khasi Hills	Nongstoin
3	Jaintia Hills	Jowai
4	Ri-Bhoi	Nongpoh
5	West Garo Hills	Tura
6	East Garo Hills	William Nagar
7	South Garo Hills	Baghmara

Meghalaya attained its statehood on 21st Jannuary 1972, curved out of the then composite state of Assam. Assam, Meghalaya, Mizoram and Tripura are the states in the North East which are governed by the provision of the Sixth schedule. United Khasi-Jaintia Hills District and Garo Hills District were parts of tribal area of Assam having been placed at serial numbers I and 2 of Part A of the table appended to paragraph 20 of the Sixth Schedule, as originally enacted. This schedule was enacted so as to provide a simple and inexpensive form of self-governance to the tribal population. The Sixth Schedule carries detailed provisions for the constitution and management of Autonomous District Councils (ADCs) and laid down the powers of the ADCs. At present Meghalaya has three ADCs, viz., Khasi Hills Autonomous District Council, Garo Hills Autonomous District Council and the Jaintia Hills Autonomous District Council.

All the three tribes of Meghalaya have their own traditional institutions which have existed for generations. The institutions were developed and functioned at each level such as the village, clan and the state level.

For Khasi political institutions, each clan had their own councils known as the *Durbar Kur* presided over by the clan headman who managed the internal affairs of the clan. Next came the *Durbar Shnong* at the village level presided over by the village headman, where their main role is to ensure the common interest of the villagers such as sanitation, water supply, health, roads, education and conflict resolution. However when issues related to inter-village matters, the matter was dealt by the *Raid* or the *Raid Durbar*. The Raid Durbar was presided over by the elected headman known as *Basans, Lyndohs or Sirdars*. Above the Raid was the supreme political unit the *Syiemship*, a

[1] Shillong is the capital of the state of Meghalaya

congregation of several raids and was headed by a *Syiem* or the King. The Syiem ruled the state through the state assembly also known as the ***Durbar Hima***. The right to vote was mainly given to the male members only, and no man was allowed to enter the Durbar without a mustache (as per the Khasi tradition).

The Jaintia political system was somewhat similar to that of the Khasis. They too had the *Syiemship* headed by the Syiem, which was the supreme among all the political institution. Next were the *Raids*, a congregation of the Jaintia village and was headed by the *Dolois*. They were responsible for performing the executive, magisterial, religious and ceremonial functions at the Raid level. However, at the lowest level was the *village headman*. Each of the political institutions had their own councils or *durbars*. Like the Khasis, the Jaintia also had their elections done mostly through male suffrage.

Unlike the Jaintia and the Khasi political institutions, the Garo political system was quite different. *A-King* - comprising of a group of Garo villages was the only political and administrative authority in the political institution of the Garos. A-king was headed by the *nokmas*, who performed both the judicial and legislative functions. The nokmas gathered together in case there were issues relating to A-King. It is believed that the Garos did not have well-organised councils or Durbars.

3.1.1. People of Meghalaya

The people of Meghalaya are largely inhabited by the three tribal groups of people – the Khasis, the Jaintias and the Garos. The Khasis and the Jaintias are believed to trace their origin or have a linkage with the Mongolian race whereas the Garo people are believed to have originated from the Tibeto-Burman race. There are about twenty-four communities in the state amongst which fifteen are scheduled tribes that have migrated from other states. The non-tribal communities are twelve in number who have said to have migrated to Meghalaya for trading and business purposes.

Khasis, Jaintias and Bhois are collectively known as the *Hynniewtrep* (Seven huts) people and belonged to the Mon-Khemar sub-family of the Austro group of people. The Khasi people or community are divided into five different groups, viz. Khasis, Wars, Pnars or Jaintia, Bhois and Lyngans (fusion of Khasi and the Garo). The Khasis are also divided into a number of clans, which trace their descent from ancestrasses or Kiaw, one Common ancestress descendents are called *Shi Kur* and sub-clan is called *Shi-Kpoh*. The family (*iing*) is the smallest division of the clan.

The Garo people like to be called as *Achick* and are part of the greater Bodo-Kacheri family both by culture and language. The Garo people were again subdivided into three major groups viz. Marak, Momin and Sangma. Garo Society or community is divided into 12 (twelve) sub-dialectical groups who inhabit in different locations of Garo hills.

3.1.2. Culture of Meghalaya

Meghalaya is rich in cultural heritage, dance, music and sports which reflect their way of life. The people of Meghalaya live a simple and lead a tribal lifestyle. The hills of the state echoes with the festive sounds and merry making by the people revealing the simple life of the tribal people. The Khasi, Jaintias and the Garo make up the largest portion of tribal people living in Meghalaya. Though they have their own cultures values and beliefs which are different to each other but they share a common peculiarity - a traditional, matriarchal law of inheritance, where the youngest daughter gets the family property which is passed on to her by the mother. Christianity has covered up all the section of the society. The traditions, practices, and festivals continue to be a part of the community living. Some traditions have been maintained by the farmers especially to celebrate at harvest – the Khasis celebrate KaPomblang Nongkrem and Shad Sukmynsiem, the Jaintias celebrate Behdiengkhlam, and the Garo celebrate Wangala.

In spite of many changes around the people of Meghalaya in the culture scenario, the tribes of Meghalaya still could keep their autonomy and ancestral institutions alive. In fact their social organizations provide the most perfect examples of the still surviving matriarchal institutions.

3.2. ICT@Schools – The Implementation

The implementation of the scheme was done through an agency – M/s Aces Infotech Private Limited. This agency has been involved in the project on an annuity model. The agency was entrusted with the responsibility of implementing the scheme in all the seventy five (75) schools. This was done in terms of two separate contracts –

- Memorandum of Agreement dated 6th October, 2009 for 38 schools in the districts of East Khasi Hills, Jaintia Hills, Ri-Bhoi and West Khasi Hills

- Memorandum of Agreement dated 18th February 2010 for 37 schools in the districts of West Khasi Hills, West Garo Hills, East Garo Hills and South Garo Hills.

Both these contracts were for a period of 10 months from the date of signing the agreement. As per those agreements, the responsibilities for implementing the scheme were shared by the different implementers - Government of Meghalaya, the School and M/s Aces Software Pvt. Ltd. - as follows:

3.2.1. Government of Meghalaya:

- Obtaining telephone connections and making payment for the telephone bills
- Obtaining Internet connections, wherever feasible , for each school
- Maintaining working conditions for computer hardware, software and necessary infrastructure like UPS and furniture
- Providing power connection inside the computer room with proper ‘earthing’

3.2.2. School

- Bearing the cost of connection and recurring cost for Internet usage
- Bearing the electricity charges
- Bearing the insurance charges of computers and peripherals/equipment
- Providing adequate furniture

3.2.3. Aces Infotech

- Providing one full time faculty at a minimum salary of 3,000/- per month (inclusive of PF, ESI, etc.) for each school. These faculty members should be at least graduates having adequate knowledge in computer technology or have qualification in computer technology or equivalent.

- Providing computer education to the students and teachers of classes V to XII through blended training program to create awareness of students and teachers in Computer Applications and Concepts.

- Ensuring availability of hardware, other accessories and software during the duration of the project. Any problems related to these and infrastructural facilities need to be reported to the school authorities immediately.

- Providing training to a minimum of three teachers in each school, wherever feasible, during the agreement period.

- Providing course material in English language to students of class V to XII of computer Literacy Program

- Providing licensed software required to teach students of classes V to XII, the cost of which will be borne by the school

3.3. ICT@Schools – ICT Infrastructure Provided

As per the document available from M/s Aces Infotech Pvt. Ltd, each school under the scheme was provided with the hardware listed in table 3.2.

Table 3.2-ICT hardware provided to schools

Items with description	Numbers
Computers: Intel Pentium Dual Core E 2180 2.0 GHz, 1 MB L2 cache. 800 MHz with Intel EM 64T/Intel 3 series of better on OEM motherboard, 1 GB DDR2 RAM, 160 GB SATA HDD, 15" TFT Digital Color Monitor, 104 keys keyboard, optical mouse, 8X or better DVD ROM drive; Windows Vista Business preloaded	10

Items with description	Numbers
with Media and Documentation and Authenticity; Norton, McAfee, Etrust or equivalent antivirus with 60 days License	
UPS: 0.5 KVA line interactive UPS	10
Laser Printer: 600X600 dpi mono, paper size A4, 14 PPM, 1 USB port, 10/100 Network card	1
Scanner: Flat Bed Document Scanner – A4/Legal size, 1200X1200 dpi resolution	1
Networking Accessories: 16 port 10/100/1000 Mbps Gigabit Switch, 24 port CAT6 jack panel, 19inch 12U 630mm depth Racks	1
Networking cables: CAT6 UTP cables, CAT6 1 m patch cord, CAT6 1 m patch cord	As per requirements

As per the same source, the following software were provided to each of the schools

- Windows Vista Business with media
- MS Office 2007 Professional MOLP with Media (Academic version)
- 'C' Compiler
- Basic Programming (Interpreter)
- McAfee Antivirus with 1 year license media

3.4. ICT@Schools – Distribution of Schools

As per the 2011 Census, there are a total of 22 urban centers in the state – 10 statutory towns and 22 census towns[1]. Of the ten statutory towns, six has municipal boards and the other four has town committees.

- Shillong – Municipal Board. In addition, there are 11 Census Town included within the area of Shillong and Upper Shillong. They are Shillong Cantonment Board, Mawlai Census Town, Pynthormukhrah Census Town, Nongmynsong Census Town, Mawpat Census Town[2], Umpling Census Town[2], Nongthymmai Census Town, Madanriting Census Town, Nongkseh Census Town[2], Umlyngka Census Town[2], Lawsohtun Census Town[2]

- Jowai – Municipal Board

- Tura – Municipal Board

- Williamnagar – Municipal Board

- Baghmara – Municipal Board

[1] Source: http://censusindia.gov.in/2011-prov-results/data_files/meghalaya/2highlighs.pdf and http://censusindia.gov.in/2011-VillageDirectory/Directory/short_code_urban_17.pdf accessed on 4th May 2011)

[2] These were not considered as Census Towns during 2001 census

- Resubelpara – Municipal Board
- Nongstoin – Town Committee
- Nongpoh – Town Committee
- Mairang – Town Committee
- Umroi – Census Town
- Sohra (Cherrapunjee) – Census Town
- Khliehriat – Town Committee

However, while talking about 10 statutory towns, the census web page leaves out Khliehriat, which has a town committee[1]. Thus, the same is being considered as urban area for this study.

As per 2001 census (since all the relevant figures of 2011 census are not yet available), the total population of Meghalaya was 23,06,069[2] with the urban population of 4,54,111[2]. Thus the percentage of urban population was 19.69% of the total population of the state.

The 75 schools where the ICT project has been implemented is distributed over all the districts. These were selected from among 1328 schools of the state. The total 1328 schools are those which have classes having at least Upper Primary classes, thus could have been a beneficiary of the scheme.

Table 3.3- Distribution of schools across districts

District	Total Schools (Upper Primary Onwards)[3]	Schools with ICT Scheme
East Garo Hills	240	6
East Khasi Hills	319	18
Jaintia Hills	103	13
RiBhoi	30	6
South Garo Hills	73	4
West Garo Hills	325	17
West Khasi Hills	238	11
Total	**1328**	**75**

[1] Source: Memorandum to the Twelfth Finance Commission submitted by Govt. of Meghalaya (http://meghalaya.nic.in/Main_Memorandum_12thFC.pdf last accessed on 4th May 2011)
[2] Source: Meghalaya State Development Report (http://megplanning.gov.in/MSDR/urban_development.pdf last accessed on 4th May 2011)
[3] Source: http://megeducation.gov.in/dsel/statistics/statlpup.html last accessed on 4th May 2011

Of the total of 75 schools where the Scheme for ICT @ Schools has been implemented in Meghalaya, 11 are in urban areas, while the remaining 64 are in rural areas (the demarcation of urban and rural areas is considered as per 2001 census). Thus 14.67% of schools in the urban areas are supported by this scheme. The emphasis is rightly provided to the rural schools, since there are other schools in urban areas which are already having ICT facilities for their students.

3.5. Provision of the Scheme vis-à-vis their status at Meghalaya

As per the original scheme document, other salient recommended activities at the state level and their status in Meghalaya as of now are detailed out in table 3.4.

Table 3.4-Provisions of ICT@Schools schemes vis-à-vis Meghalaya

Provisions as per the scheme	Status of Implementation
Under the CLASS component of the scheme, the Union Government is to provide 75% of financial assistance to the states/Union Territories. Assistance to special category states will be in the ratio 90:10.	Not a part of the evaluation
The provision for software shall include Learning Management Systems and curriculum based courseware apart from operating system and other application software	In the first ten months of the scheme, only operating system and productivity tools like Microsoft Office has been provided. Implementation of learning management system has not been undertaken. Curriculum based courseware in the form of CDs for various subjects have been provided to the schools very recently on renewal of this scheme for another ten months with the same vendor
An amount of Rupees One 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	In the first ten months of the scheme, no development work was undertaken in terms of software, teaching tools, designing of training models.
Ministry of Human Resource Development (MHRD) shall endeavor to institutionalize content development through National Education Portal	Not a part of the evaluation
KVS and NVS each would convert one school per state/UT into SMART schools subject to availability of funds. A grant of not more than 25 lacs would be provided per SMART schools. A sum of 2.5 lacs shall be provided	In the first ten months, KVS and NVS has not set up any SMART school in the state.

Provisions as per the scheme	Status of Implementation
as recurring costs which include maintenance, consumables, internet usage and monitoring costs	
State Institute of Educational Technology (SIET) are to develop course materials/ audio-video materials for usage at classes	There is no SIET in the state of Meghalaya, and no initiative to develop such course materials have been undertaken by any government agency. The implementation partner – Aces Infotech – has been entrusted with the responsibility to supply educational CDs based on the curriculum.

Chapter 4

Framework for Evaluation

4.1. Background

Interest in the potential of ICT has been especially intense since the popularization of the Internet and ongoing advances in personal computing. Many models and initiatives, ranging from e-government and e-education, to telecenters, have been launched around the world. Governments in developing countries, foundations and international development organizations recognize that ICT is a key component to improve the competitiveness of nations, to foster economic and social development in marginalized communities and to increase transparency and effectiveness in the provision of public services.

Within this context, the need to develop frameworks to evaluate the way in which different ICT initiatives are impacting social processes cannot be underestimated. The development of these evaluation frameworks is crucial for the following reasons:

- Lessons learned from on-going initiatives can help guide future investments in ICT for development projects that are more responsive to local needs.

- Rigorous evaluation reports of the performance of these initiatives will help inform and guide a more effective public policy and program planning (Roman and Colle, 2003)

- Evidence from successes in different initiatives can ignite confidence and bring other key stakeholders to the table, especially in programs where different actors compete for resources (for example in the case of e-government initiatives).

- Systematic research approaches that are multidisciplinary, comparative, and multicultural will contribute to generating a valuable body of literature that is less technological deterministic in nature and more oriented towards human development.

4.2. The Balanced Scorecard (BSC) Approach

Balanced scorecard (BSC) is a multi-dimension tool to specify the operation and strategic management in all levels by linking objectives, program, project or activities, evaluation and strategies of the organization together (Mesutta & Satchukorn, 2004). As a model of performance measurement and feedback, the BSC is effective in that "it articulates the links between leading inputs (human and physical), processes, and lagging outcomes and focuses on the importance of managing these components to achieve the organization's strategic priorities" (Abernethy et. al., 2005).

The balanced scorecard model is widely used in practice, and the BSC has been an extensively researched performance measurement system (Marr & Schiuma, 2003). The BSC provides a framework for selecting multiple performance measures related to strategic goals. It supplements traditional financial measures by integrating non-financial measures in three additional perspectives – customer, internal process and learning and innovation. Kaplan and Norton (Kaplan & Norton, 1992; Kaplan & Norton, 1996a, 1996b) intended the BSC both as a tool for aligning and communicating strategy and as well as compensation tool. At a broader level, the BSC can be used as an organizing framework for a strategic management system (Kaplan & Norton, 1996a, 1996b) that links an organization's long term strategy with short-term actions. A fundamental principle in a balanced scorecard is to align the organization to the strategy.

The firm's strategy is formulated at the top of the organization, and it is cascaded downward so that goals, measurements and targets are used throughout the organization to implement strategy (Kaplan & Norton, 2001a, 2001b). An essential BSC concept is the articulation of hypothesized cause-effect linkages between performance measures and strategic objectives (Banker, Chang, & Pizzini, 2004; Kaplan & Norton, 2001a, 2001b). Some measures are viewed as performance drivers (leading measures) that are essential to achieving a desired outcome, which is measured by an outcome measure (lagging measure). The strategic hypothesis is that we will achieve our targets for the performance drivers, and the result will be that we will achieve the desired outcomes, which will be reported by lagging measures. The BSC model has evolved, and strategy maps are used to show the cause and affect linkages.

Proper implementation of a BSC requires four processes (translating the vision, communicating and linking, business planning, and feedback and learning) to link long-term strategic objectives with short-term action. The process of translating the vision helps build consensus around the organization's vision and strategy. The process of communicating and linking calls for broad participation in creating the scorecard. Participation of different layers of management (senior executive and lower levels) offers several advantages -- reduction in information asymmetry, better understanding of long-term strategic goals by managers, and stronger commitment to achieving the goals. However, to align (link) operating subunits and individual employee performances with the overall strategy requires three additional organizational activities -communicating and educating,

setting goals and linking rewards to performance measures. The business planning process enables integrating strategic planning with financial budgets to ensure resources are available to fund initiatives that support achieving the goals.

The feedback and learning process involves the re-examination of strategy and its implementation. In setting goals, high-level strategic objectives and measures need to be translated into objectives, measures, and targets for each measure at the level of operating units and individual employees. Often however, stretch targets are used to drive organizational change, and the change emphasis is expressed through performance evaluation. Stretch targets are targets that are set at levels that, if achieved, will transform the organization within a period of three to five years. In theory, stretch targets that represent a discontinuity should have two features; allow the measures to be linked by the hypothesized cause effect- relationships (strong hypothesized correlation) and consensus of all managers on the targets. In addition, adequate financial and other resources must be provided to achieve the ambitious targets for the objectives and measures (Kaplan & Norton, 1996a, 1996b).

4.3. The Balanced Scorecard and IT

Organizations around the world are transforming themselves for competition that is based on information and intangible assets, which have become far more important in the current global economy.

Martinsons et al. (1999) adapted the balanced scorecard for the strategic management and leveraging of IT resources in organizations. They suggested four perspectives for IT balanced scorecards—user orientation (end-user view), business value (management view), internal processes (operation-based view), and future readiness (innovation and learning view). The reasoning was that the IT department is typically an internal rather than external service supplier, and projects are commonly carried out for the benefit of both the ends users and the organization as whole, rather than individual customers within a large market.

The growing dependence of most organizations on their information assets and information systems, coupled with the risks, has made Information Security Governance an important use. According to Information Security Governance (ISG), the five desired outcomes of information security governance include (ISG, 2006):

- Strategic alignment: Alignment of information security with business strategy to support organizational objectives;

- Risk management: Effective management and mitigation of a variety of risks to information by implementing cost-effective counter measures and by reducing potential impacts on information resources to an acceptable level;

- Resource management: Efficient and effective management of information security knowledge and infrastructure;

- Performance measurement: Measuring, monitoring and reporting to ensure that information security initiatives are helping in meeting organizational goals; and

- Value delivery: Optimizing investments in information security to achieve organizational objectives.

In addition to reducing and managing the risks in a cost- efficient and effective manner, the creation of a measurable security strategy that is based on benchmarking and continuous performance monitoring is recommended. The BSC model features strategic alignment and performance measurement for strategy implementation, and it can be designed to monitor organizational goals for risk management, resource management, and value delivery.

4.4. Approach for formulating Key Performance Measures

In order to develop good measures it is important to have a clear knowledge of the following:

- Purpose of measure
- What is to be measured
- Key concepts and methods of measure

4.5. Steps to define Key Performance Measures

The various aspects that need to be measured are:

- Measures classified into primary, secondary and senior secondary school categories.
- Measuring content, teaching and improvement of learners in
  - Creativity for Primary School.
  - Subject orientation for Secondary School.
  - Career-orientation in Senior Secondary School.
- Reliability and long-standing vision of the contents.
- Consistency in involvement of stakeholders and content providers.
  - How much students think that they have improved.
  - Impact of teaching methods.
  - Availability of infrastructure for disbursing content.
  - Change in teaching methods.
  - Efficiency of clusters and its telecommunication links within and with the urban centres.
- Teachers' confidence and acceptance in using ICT.
- Barriers to computer related activities.

4.6. Design of Balanced Scorecard

Design of a Balanced Scorecard is about the identification of a small number of financial and/or non-financial measures and attaching targets to them, so that when they are reviewed it is possible to determine whether current performance 'meets expectations'. The idea behind this is that by alerting managers to areas where performance deviates from expectations, they can be encouraged to focus their attention on these areas, and hopefully as a result trigger improved performance within the part of the organization they lead.

The original thinking behind Balanced Scorecard was for it to be focused on information relating to the implementation of a strategy, and perhaps unsurprisingly over time there has been a blurring of the boundaries between conventional strategic planning and control activities and those required to design a Balanced Scorecard. This is illustrated well by the four steps required to design a Balanced Scorecard included in Kaplan & Norton's writing on the subject in the late 1990s, where they assert four steps as being part of the Balanced Scorecard design process:

- Translating the vision into operational goals;
- Communicating the vision and link it to individual performance;
- Business planning; index setting
- Feedback and learning, and adjusting the strategy accordingly.

4.7. The Study Design

Research within Social Change and Development literature informs us about the importance of managing Interventions by measuring whatever is the intended or desired outcome(s). Such a measurement is possible with Survey Feedback method.

The cycle runs from conceptualization of a research study to design of an instrument to interpretation and feedback and back again to reformulating appropriate policies and implementation strategy with a feedback again. Conceptualizing any enquiry requires to understand and rephrase a set of research questions which may help provide some answers to bring about the desired change or improvement in any social/policy intervention. Hence, purpose of the present study was mandated us to provide a feedback on the success of the ICT@75_Schools in Meghalaya.

Understanding the purpose of the Scheme and the Goals which it aimed to achieve, and reviewing other similar experiments world over, we could establish a few agenda for ourselves and formulate a methodology which could help us provide a tool to achieve the objective of this evaluation research.

4.8. Meeting with the Key Implementing Officials

In order to understand the scope of work and appreciate the nuances involved, initially the coordinators met with the key officials on several occasions and a formal presentation was made by

the concerned department informing us about all the critical details of the Scheme implementation and few of their expectations.

4.9. Focus Group Discussion (FGD)

Based on the previous meetings to understand the purpose and details of the scheme, a Focus Group Discussion was conducted, wherein officials from all levels of the department had participated. The purpose of the FGD was to further understand the challenges and expectations of the Scheme Evaluation Process. Few of the very critical inputs about the purpose of the scheme, critical questions which needs to be probed as part of the evaluation were shared during the FGD.

4.10. Conceptualizing the Evaluation Process

An Evaluation study was formulated on the basis of the above and the coordinators' understanding of their own Subject domains. A survey research was thus conceptualized and a questionnaire was constructed to be able to capture the ground realities of the implementation of the scheme and measure the success on defined variables.

The BSC in case of IT implementation should consist of the entire pertinent dimension related to all the stakeholders and the objective of implementing ICT in schools. The following dimensions were conceptualized to assess an impact of ICT in the schools:

- School receptiveness
- Learning climate
- Computer teacher willingness
- Computer teacher competence
- School work climate
- Other subject teacher willingness
- Student performance in computer
- Student performance in other subjects

The above dimensions could be understood as following:

- *Facilitators*

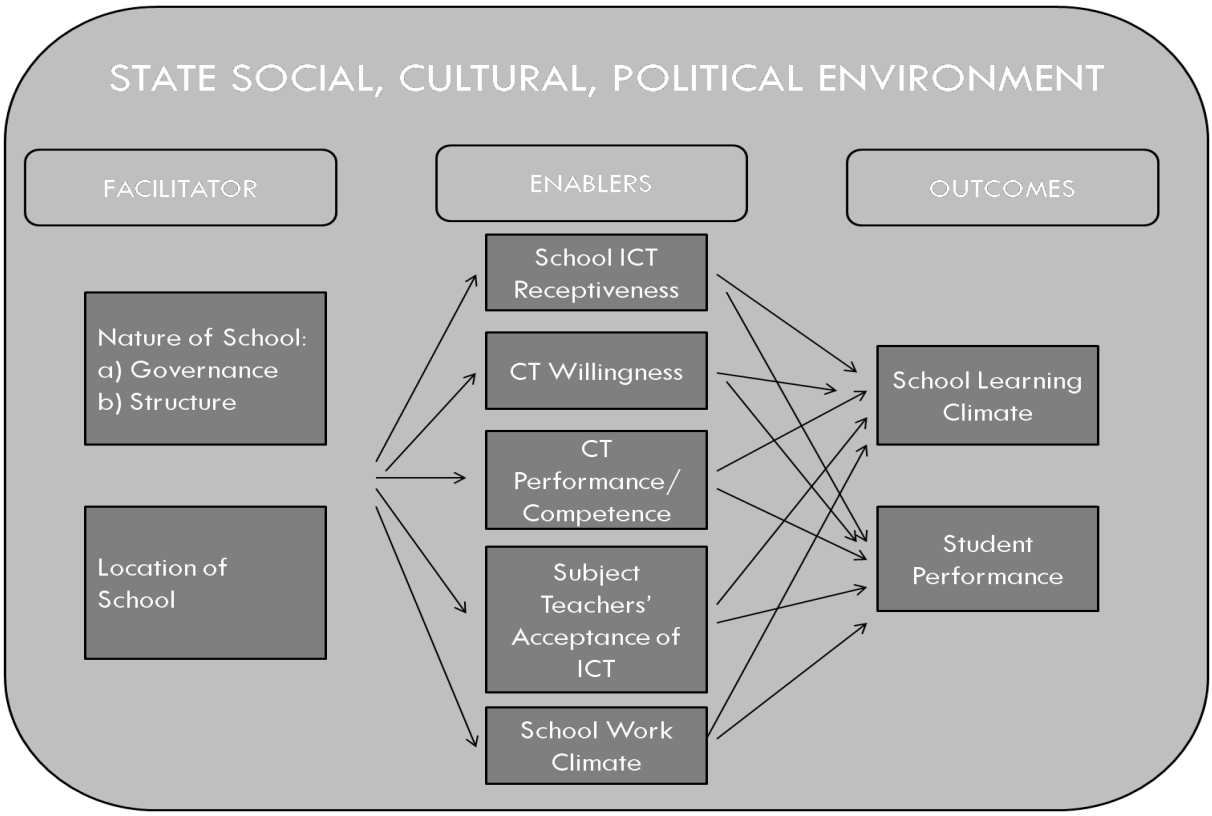
  Two Variables of School Governance Structure and their Location are treated as the Facilitator Variables which were responsible to deliver the intended facilities and enablers to achieve the stated objectives of the ICT@School.

- *Enablers*

  Enablers comprise of variables which provided the essentials to cause the outcomes to happen. Based on the understanding of how learning in schools takes place and the

understanding of school as an organization to deliver learning outcomes, the survey questionnaire consisted of questions relating to following variables:

Figure 4.1: Conceptualization of current study



- School ICT Receptiveness: The extent to which the school is ready to take advantage of ICT interventions
- Computer Teacher Willingness (to be a teacher of the subject)
- Computer Teacher Competence (as a teacher of computers)
- Subject Teachers' Willingness/Acceptance of ICT
- School Work Climate (for the teachers)

The assumption being made here is that for the scheme to be able to create an impact and deliver the desired outcomes through the chosen schools, they will have these many components in place which will be either enabling the scheme or otherwise to achieve the intended outcomes.

- *Outcomes*

Like all interventions, there were a few intended outcomes of the scheme. Some of them are listed in the scheme document and we found out that the following two variables summarize the achievement of all of them:

- School Learning Climate

- Students' Performance

The model in figure 4.1 was conceptualized for the present Survey Evaluation for feedback which helped us understand the process of implementation and the outcomes achieved.

Chapter 5

The Surveyors' Impressions

To cover all the school across the districts, teams were organized to survey the 75 schools for data collection. In this chapter, we have tried to bring out the summary of field visit reports based on the observation and experiences of the surveyors visiting the respective schools they were assigned.

Most of the schools visited by the surveyors were located in the rural areas. To get access to the schools, the teams faced many difficulties. First and foremost problem they had to overcome was the road condition – some of them were not even motorable.. Some of the bridges they had to cross were made of wood; and quite a few of them were found to be damaged due to rotting of the wood. In some places, the teams had to travel under the bridge and it was difficult to cross over, especially in view of the rainy season. The teams also had to experience breakdown of their vehicles due to the road conditions, and sometimes even had to find another vehicle to reach the schools assigned to them. This shows how much difficulties the villagers overcome to travel to and fro from their respective places. In addition, the surveyors noticed that the students too had to overcome some of these difficulties in reaching the schools.

The surveyors found most of the schools to be eco-friendly and were oriented more towards the nature. But this type of environment was not found in the schools located in urban areas. While one of the schools was situated near the river, most of the schools were surrounded by trees on all sides.

Most of the schools located in the rural areas had ample space for the children to play. The most common playground facility the schools had were a basketball ground and a football ground. However, it was found that most of the children used the playground for playing cricket. Though the schools had huge playground for the children, most of the schools did not have items for playing (i.e., football or basketball, cricket bat or ball, etc.). The children were mostly found playing cricket using a wooden plank as the bat, and with a ball which most possibly had been procured through their own contributions. In one of the schools, it was found that basketball ground was used as parking lot, thereby depriving the children of that school of playing during their recess period. In most of the schools, the playground was not properly maintained or constructed.

The surveyor also found that some schools had a notice board hung outside the office. The main notice was about the payment of fees by the students. Beside the notice board, some schools had a timetable hung in the staff room or the principal's office. This indicated that most of the school followed a time table for conducting their classes. The other items found in the schools were the teachings aids like charts, laboratory aids, maps, globe, etc. One of the schools in the Khasi Hills region had warning signboards for students to learn, and even had a donation box. The surveyors assumed that the donation box was kept to raise funds for maintenance of the school.

The school infrastructure in most of the schools surveyed, especially in the rural areas, was found to be very old and some were in bad condition. The school buildings needed immediate repairing or renovation. Some schools were under construction and in some schools, the walls looked damp.

Most of the classrooms were dark and dusty, and did not have proper ventilation. Though they had windows, they had to close them due to rains. Most of these windows were made totally of wood and did not have the luxury of glass panes for light to come in. With the windows closed, the rooms were stuffy and very hot. In some of the schools, the blackboards were worn out and it was difficult for the students to read from it. In some places, the classrooms were partitioned using gunny bags, bamboo or tin. This ensured that sounds travelled freely across the partitions, making it inconvenient for both the students and the teachers.. While some schools had fans in each of their classrooms, there were hardly any proper lighting systems in most of the schools. There were no proper bathroom facilities for both boys and girls in some schools. Most of the school did not have a school library.

It was observed that the students were quite shy but playful. They were very eager to learn but due to their family background they are not been able to concentrate only on their studies. Since their schools were located in rural areas, they are left out from rest of the region due to bad road conditions. Most of the students had to travel on foot to reach their schools. It was found that some of students had to miss their classes on the market day of the week, as they had to help their families to sell their vegetables and earn their living.

Most of the students the surveyors met were from poor family background. They also had problem in communicating in English. The only language they understood was their mother tongue. Moreover the classes were also taken in the language they understand, and not much emphasis was provided in using English. During the survey, the surveyor had problem in communicating the form to them. The surveyor had to use sign language or call the teacher to translate the survey questions in the language they understood. The confidentiality of the students' response from their teachers could not be maintained in those cases.

The students were very keen in learning computers. But it seems most of the school had more of theory classes than practical classes. In some schools, no computer classes were conducted for the

students as there was no computer teacher, either because the computer teacher appointed by Aces Software had left or did not turn up.

Most of the schools had separate computer room but that was not adequate for catering to the needs of the students. In some of schools it was found that only few computers were being installed and the rest kept unpacked aside due to inadequate furniture or power supply. Most of the schools did not take proper care of the computer; this may be due to lack of knowledge as to how to care for those computers. It was observed at many places that the computers were either not working or were having other problems like UPS was not working, mouse been damaged by the rats, or had software and hardware problems. Most of the computer rooms were not well furnished and did not have proper wiring system and sitting arrangements for the students. The schools which did not have a separate computer room had to use either the staff room or the library room. Surveyors also found schools which conducted their computer class in the school managing committee secretary's house or in the teachers' quarters or even in the community hall. Most of the schools which had internet connection and telephone connection could not use them properly due to network problems. It was informed that due complaints were made to the service providers, but mostly no action were being taken by the latter – even though the bills were paid in time.

There were however few schools where the computers were well maintained. The computer rooms in these schools were very clean and things were kept in proper order, and had a proper lighting system and power supply. The computer were covered and arranged nicely. Beside this, there were also proper and adequate sitting arrangements for the students. In one of the schools, the computer room even had a white board and a computer chart. This indicated that these schools were trying sincerely to impart computer education to the students.

In some schools, it was found that the teachers were not punctual to school. Proper training seemed to be lacking for all the subject teachers including the computer teacher. Most of the computer teachers were very much concerned about their job security and their salary. One of the computer teachers was confused about the syllabus and had stopped taking the classes for some time. Most of the computer teachers were having problem in conducting practical classes, as the number of computers were not enough to cater the needs of the students.

Lastly, most of the surveyors were happy with the cooperation they got from the school authority when they reached the schools. They found both principal and the teachers to be very helpful and willing to help. While the surveyors had problem in communicating with the students due to language, they found most of the students to be well disciplined. The surveyor found the students very interested in learning computers, but due to some inhibiting factors (non-availability of computer teacher, no proper sitting arrangement, less number of computers, etc.), they are not been able to fully benefit from the scheme.

Chapter 6

Data Analysis and Observations

Based on the data received in response to the survey questionnaire, this chapter provides detailed information about the schools based on various parameters.

The ICT schemes have been provided to 75 schools which has been distributed across all the seven district of Meghalaya. As part of the survey out of the 75 schools, 3 schools could not be visited viz. Jaingaiti Sec School, Nonkhyllam, Ranikor; Indra Gandhi Memorial Sec School, Rangasora, Ranikor; and Baite Secondary School, Mawslei, Saipung; because of accessibility issues. However, out of these 3 schools, 2 schools could be covered through telephonic survey. Rymbai Government Secondary School, Khliehriat refused to participate in the survey when the teams visited the school. The data for another 2 schools (Rongram Secondary School, Rongram and Zikabari Higher Secondary School, Salsella) could not be collected as the schools were on holiday when the team visited the schools.

Out of the 75 schools 69 schools and 71 schools responded to the Form 1 (based on on-site visit) and Form 1A (based on telephonic conversation) respectively. Though the team tried to contact all the 75 schools over telephonic conversation but could not reach all the schools despite best efforts due to network problems. The team tried to visit the school, but could not reach to some schools because of accessibility issues. Though all the schools which the teams surveyed filled up the forms, there were some questions unfilled here and there. Some of the schools did not like to comment on few of the questions relating to their schools, while in some other cases the principal were not available and the respective concern in place of the principal did not know much about the school. After the field survey the teams tried to contact the principal in those cases and managed to get some part the forms filled in. Therefore, the total number of schools responding to different questions is different.

6.1. About the schools

75 schools are covered under the ICT schemes and they are distributed among the seven district of Meghalaya. Table 6.1 shows the distribution of schools under the ICT@schools scheme among the different districts based on the location of the schools.

Table 6.1: Location of Schools (District Wise)

Sl.No	District	Rural	Urban	No. of Schools covered by ICT	Total No. of schools
1	East Garo Hills	5	1	6	1170
2	East Khasi Hills	15	3	18	1267
3	Jaintia Hills	11	2	13	677
4	Ri-Bhoi	6	0	6	236
5	West Khasi Hills	11	0	11	1103
6	West Garo Hills	15	2	17	1645
7	South Garo Hills	4	0	4	512
	Total	**67**	**8**	**75**	**6610**

Out of the 75 schools, the maximum numbers of schools (67 schools) are in the rural areas which constitute 89% and the rest 8 schools are under the urban areas which constitutes only 11%. East Khasi Hills is the districts which have the maximum number of schools which has been covered by the ICT schemes; it has the maximum number of schools in both the rural (15 schools) and urban areas (3 schools) as compared to other districts. The following figure 1 gives a clear picture of distribution of schools district wise.

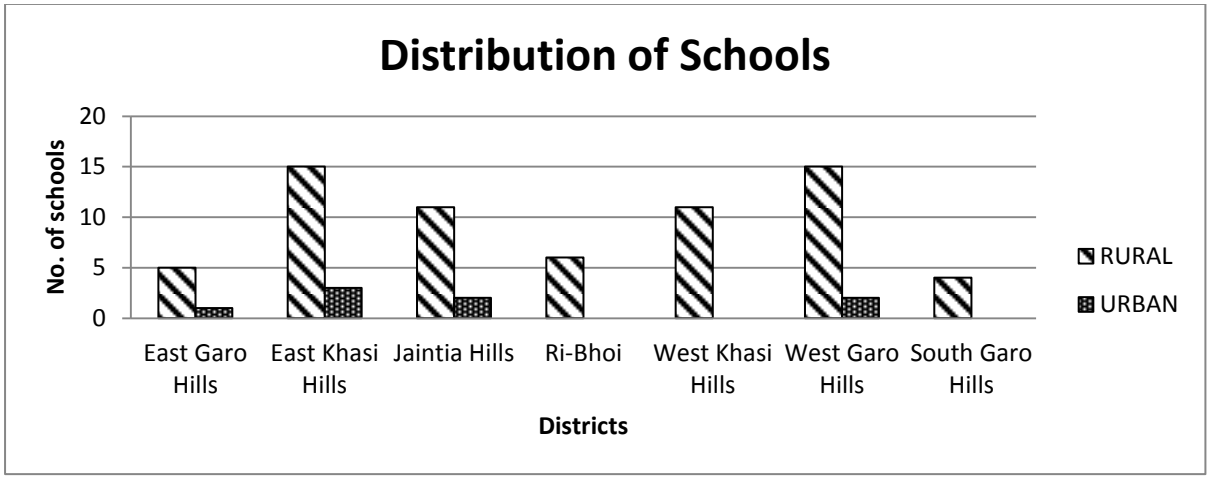


Figure 6.1: Distribution of schools implementing ICT @Schools in different districts of Meghalaya

The figures which are obtained district wise are incomparable due to number of schools not being equal. In order to have even distribution of data so that the same becomes comparable, the seven

districts have been combined together according to certain similarities in culture and language and categorized into three cultural areas - Khasi Hills, Garo Hills, Jaintia Hills and Ri-Bhoi. The category Khasi Hills consists of West Khasi Hills and East Khasi Hills districts. The Garo Hills category is the amalgamation of West Garo Hills, East Garo and South Garo Hills districts. Jaintia Hills district has been clubbed with Ri-Bhoi district as their language is quite similar to each other, and the distribution of schools was also less and geographically they occupied comparatively less area. However, the main parameters are also compared district-wise in Appendix II.

Table 6.2 shows the details of schools. It shows the distribution of schools area-wise. As already mentioned, The distribution of schools is 35 % in Khasi Hills, 32 % in Garo Hills and 23 % in Jaintia Hills and Ri-Bhoi. This shows that the ICT@schools have been emphasizing more on the rural areas so as to uplift the education level and remove the gap of education between the rural and the urban areas.

However, the percentage of schools covered by the ICT from the total schools in Meghalaya (total number of schools) is about 1.13%, where Jaintia Hills and Ri-Bhoi category got the highest percentage i.e. 2.08%. This may be so because the total number of schools in this area is quite small as compared to other areas.

Teachers are the most important factor which helps in students learning. Out 1143 total number of teachers 198 (17%) teachers were surveyed. The teachers who were surveyed were from all subject areas. However when we looked at the number of computer teacher based on data provided by M/s Aces Infotech, the number (51) does not match with the number of schools (75 schools). This is so because some of schools either did not have a computer teacher or the computer teachers were being appointed by the school itself. Most of the computer teachers appointed by M/s Aces Infotech were unhappy regarding their salary and job security as they were being appointed on contract basis. These teachers were also complaining about the number of computers provided being very less as compared to the number of students they have to cater in each class.

When we look at the enrolment structure of the school, it was found that the schools covered under the ICT@Schools scheme covered were mostly Co-educational. This indicates that emphasis was given to educate both girls and boys about computers. This shows there was no gender bias. Out of the 75 school, 68 schools for which the data of the schools were collected were co-ed comprising of 10,305 boys and 11,691 girls. It shows that the ratio of girls is higher than that of boys.

The total strength of the 69 schools students is 21,996 (surveyed), out of which 47% of students comprise of boys and 53% of students comprise of girls. The maximum number of students enrolled in school is in class 9 with a total strength of 3474 students where the percentage of boys to girls is same. The minimum number of students enrolled in the schools is in class 11 with a total strength of 225 students where the percentage of girls is higher compared to that of boys by 4%.

Table 6.2: Details of School

Sl. No.	Area	Location			No. of Teachers		No. of Aces Teacher		Enrolment of Students						Total No. of schools
									Boys			Girls			
		R	U	% (*)	S	T	S	T	O	S	T	O	S	T	
1	Khasi Hills	26	3	1.22	81	482	16	20	2806	238	5350	2960	227	5200	2370
2	Garo Hills	24	3	0.81	72	399	14	20	2249	147	3784	2367	158	3698	3327
3	Jaintia Hills and Ri-Bhoi	17	2	2.08	45	262	8	11	765	140	1171	1716	189	2793	913
Total		**67**	**8**	**1.13**	**198**	**1143**	**38**	**51**	**5820**	**525**	**10305**	**7043**	**574**	**11691**	**6610**

NB: (*) - %of no of schools covered/ All schools

(R-Rural, U-Urban, S- Surveyed, T- Total, O- students opted for computer class)

From table 6.2, it is found that out of the 11691 total numbers of girls, 7043 number of girls (i.e. 60%) opted for computer and out of 10305 total numbers of boys, 5820 number of boys (i.e. 56%) opted for computer class. This shows that the percentage of girls was more compared to that of boys' who opted for computer class. However, when we looked at the number of students opted for computer class area wise, it was found that the boys were more in Jaintia Hills and Ri-Bhoi cluster (65 % compared to 61% that of girls) as compared to other areas where the number of girls was more. This may be so because the number of boys was more in these areas who went to schools. It may be noted that most of the schools has made computer classes compulsory at different levels according to their enrollment structure.

Out of 69 schools of which the data were collected, 18 schools had students with special needs. Out of 111 special needs students only 45% of special needs students enrolled for the computer classes.

Table 6.3, shows the distribution of schools based on the nature of school. Out of the 75 schools, 69 schools responded to this question. The maximum number of schools was either government aided (45%) or deficit schools (i.e. 32%). This shows that most of the schools were not financially strong and had to depend on others for running the school.

Based on area clusters, the maximum number of schools in Khasi Hills and Garo Hills (i.e., 11 schools and 15 schools respectively) are government aided. This is however different in the case of Jaintia Hills and Ri-Bhoi cluster. Figure 6.2 shows the nature-wise distribution of schools across different clusters.

Table 6.3: Nature of schools (Area Wise)

Sl. No.	Area	Govt.+Deficit	Govt. Aided	Others	Total
1	Khasi Hills	9	11	9	29
2	Garo Hills	8	15	4	27
3	Jaintia Hills and Ri-Bhoi	7	5	7	19
	Total	24	31	20	75

(Others- Trust, Society, Community, Missionary Funded, Adhoc and Private)

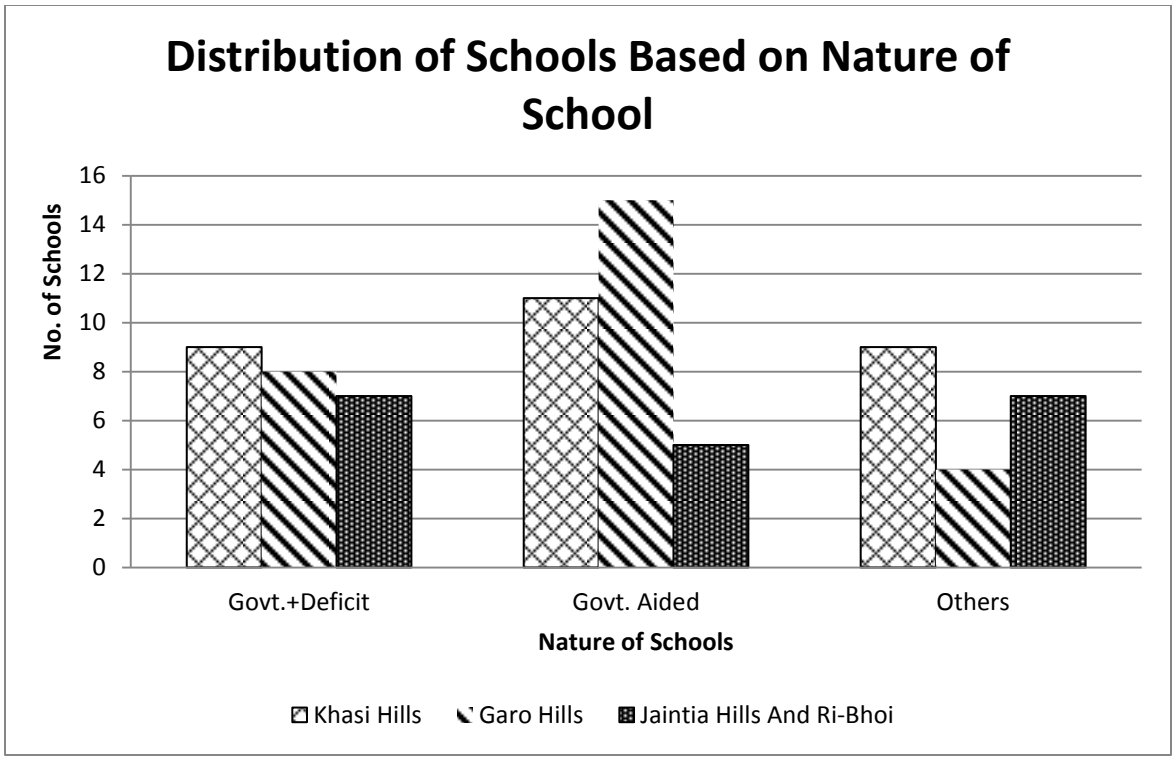


Figure 6.2: Nature-wise distribution of schools across different clusters

Table 6.4 shows the school capacity based on the nature of schools. As already mentioned, most of the schools are government aided. When we looked at the distribution of classes based on the nature, it is found that class 5 to 10 got the maximum number of schools that either government or deficit.

Table 6.4- School Capacity (Nature Wise)

Sl. No.	Classes	Govt.+Deficit	Govt Aided	Others	Total
1	1 to 10	1	4	1	6
2	1 to 12	2	1	-	3
3	4 to 10	-	2	-	2
4	4 to 12	1	-	-	1
5	5 to10	8	1	3	12
6	5 to 12	1	2		3
7	5 to 9	-	-	2	2
8	6 to 10	1	1	1	3
9	8 to 10		5	2	7
10	8 to 12	-	1	-	1
11	9 to 10	1	7	-	8

Sl. No.	Classes	Govt.+Deficit	Govt Aided	Others	Total
12	9 to 12	2	2	-	4
13	Nursery to 10	2	4	3	9
14	Nursery to 12	2	-	2	4
15	Nursery to 9	1	-	-	-
16	Pre Primary to 10	-	-	1	1
17	Primary to 12	-	-	2	2
	Total	**22**	**30**	**17**	**68**

6.2. Classes and their composition

The classes were scheduled as per the timetable for all 69 schools who responded to this question. The duration of classes varied from school to school which ranges from 30 minutes to 60 minutes per class. Besides timetable, all 69 responding schools had an attendance register while 53 schools had academic calendar.

The class level differed from school to school. The class level ranges from nursery to 10, 5 to 10, 9 to 10, 1 to10, 8 to10, 1 to 12, 5 to 12, etc. The total number of students who appeared in the HSLC from the surveyed schools in the year 2010 was 1843 out of which 1141 (62 %) passed.

The number of sections per class also varied across schools. Out of 69 schools reponded, most of the schools had at least 2 sections per class in their school except for class 11 which had only 1 section.

6.3. Funding

Since most of the schools were from rural areas, they mostly had to depends on other sources of funds besides their own funds. Out of the 69 responding schools, 30 get funds from the State Government, 17 schools get it from Sarva Shiksha Abhiyan, 13 schools gets from the church, 6 schools from the local Durbar and 7 schools from the MLA area development fund. These funds received are being utilized differently by the schools depending upon their needs.

6.4. Physical Infrastructure

It was very difficult to reach quite a few schools due to the road conditions. The only way to reach some of the schools was through telephone. Out of the 69 schools responded, 43 schools had telephone connection - 28% had landline connections and 72% had mobile connections.

Out of the 69 schools responded, only 10% were having E-mail ids. This shows that the schools are not much into information technology themselves. Besides this, the other reasons may be that there is no power supply or had network problems.

Out of 69 schools, 63 responded about their physical infrastructure. Out of the 63 schools 36 had 1 building of their own, 14 schools had 2 buildings of their own, 8 schools had 3 buildings of their own, 3 schools had 4 buildings of their own, 1 schools had 5 buildings of their own and 1 schools had even 7 buildings of their own. Out of the 63 schools 1 school even had rented 1 building.

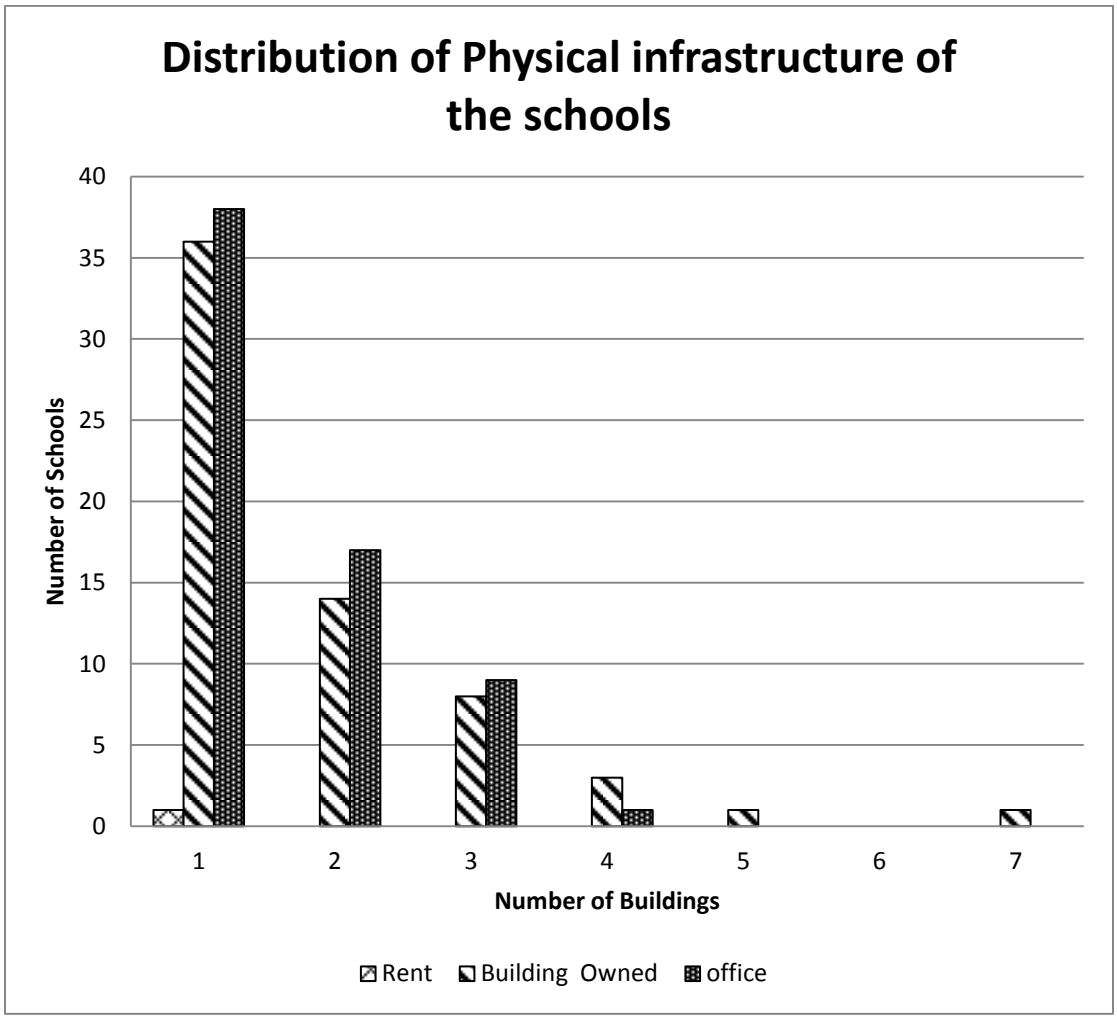


Figure 6.3: Distribution of Physical infrastructure of the schools

As for the number of office rooms a school had, 38 responded as having 1 room, 17 responded as having 2 rooms, 9 responded as having 3 rooms and 1 responded as having 4 rooms.

The total number of bathrooms of the 69 responding schools was 90 - 42 were for girls and 48 were for boys. The number of bathrooms for girls and boys range from 1 to 15. 5 of the schools responded that did not have bathrooms for their students (boys and girls).

Out of the 69 school who responded, 25 schools had 1 common room, 5 schools had 2 common rooms and 2 schools had 3 common rooms.

Besides these, the schools also had playgrounds (basketball ground and football ground) for the students to play. 47 schools had 1 playground, 3 schools had 2 playgrounds and 2 schools had 3 playgrounds.

The most important physical infrastructure of the school is the classrooms. The range of class room have been classified into four categories - 41 schools have classroom numbers ranging between 1 and 10, 20 schools have ranging between 11 and 20, 5 schools have ranging between 21 and 30, and 5 schools have ranging between 31 to 40.

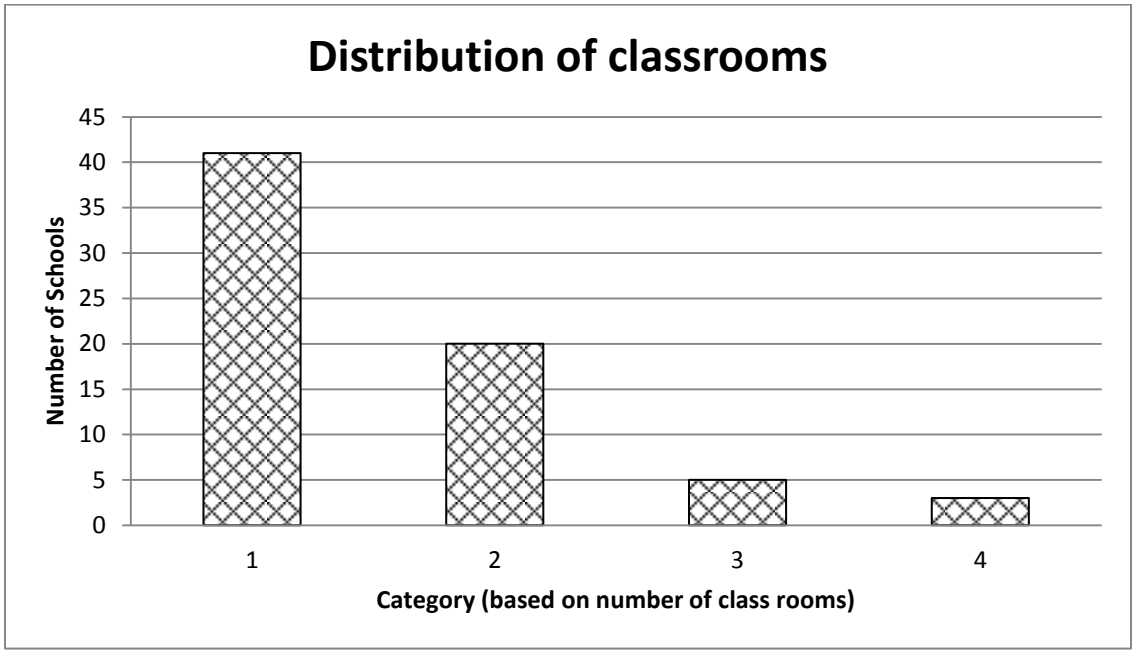


Figure 6.4: Distribution of classrooms

Some schools even reported to have hostel facilities for their students. Out of 69 schools responded 10 schools had boys hostel with an average capacity of 59 students per hostels and 14 schools had girl's hostels with an average capacity of 96 students per hostels.

6.5. Principal, Subject Teacher and Computer Teacher

Out of 75 school principals, 69 responded to the query on their basic educational qualification. Out of 69 schools, the highest qualification that the principals have is post-graduate. As for the composition, 57% of the principals are arts graduate, 32 % are post-graduate, 7 % are science graduate, 3% commerce Graduate and last 1% are Pre University (class XII) passed. Looking at the composition it seems that those who pursue arts streams are more interested in teaching jobs.

Table 6.5: Principal's Educational Qualifications (Additional)

Sl.No.	Degree	Percentage
1	B. Ed	94
2	B.T	2
3	M. Ed	2
4	Theology	2
	Total	**100**

Besides the above basic qualifications, the principals have additional qualification as seen in table 6.5. It seems that most of the principal pursued B.Ed. as their additional qualification which constituted the highest percentage of 94%. It is also a requisite to have qualified B.Ed. as per the Government rules. Out of 69 principals who responded, 15 principals (i.e., 20%) had an e-mail id – another indicator of how ICT savvy they themselves were.

The total numbers of teachers in the 67 responding schools was 1078. Out of these 1078 teachers, 98% were appointed on regular basis, and 1% each on contract and part time.

In this 1078 teachers, 154 were science teachers of whom 51% had computer knowledge, 126 were mathematics teachers of whom 45% had computer knowledge, 170 were English teachers of whom 43 % had computer knowledge and 90 were computer teachers. Out of 540 schools teacher responding to this question, 87 teachers had computer at home. In the 67 responding schools, 44 schools teachers (20%) could learn computer from the computer teacher appointed by M/s Aces InfoTech. 22 schools organized formal training where 63 interested teachers participated for learning computers.

As for the appointment of computer teacher in these 67 schools, 76% was appointed by the M/s Aces Infotech and the rest by the schools themselves. 61% of the computer teachers were residing in the same locality. 70% of the computer teachers appointed by M/s Aces Infotech were still present in the

schools. The remaining 30% left because either they had got a better job opportunity or were having problem with the salary they received.

6.6. School Administration

The total number of Managing Committees (MC) members in 68 responding schools was 794 - an average of 12 members per school. Out of the 794 MC members, 58 schools had a total representation of 478 local community members in their MCs - an average of 9 members per school. 32 schools had the local headmen in MC. 67 schools had a total representation of 287 teachers in MC - an average of 4 teachers per school.

The frequency of managing committee meetings differed from schools to schools and depended upon the needs of the school. Out of the 67 responding schools, 41 stated that they conducted their meeting quarterly, 12 stated that they conducted the meetings bi-annually, 9 stated that they conducted the meetings monthly and 5 stated they conducted the meetings annually.

Besides having MC meetings, the schools also conducted parents-teachers meetings (PTM). Out of the responding 67 schools, 35 stated that they conducted these meeting bi-annually, 15 stated that they conducted the meetings quarterly, 14 stated that they conducted the meetings monthly and 1 stated they conducted the meetings annually.

6.7. ICT @ 75 Schools

The total number of computers in the 70 responding schools was 973. Out of these, 68% of the computers were from the ICT@schools scheme, and the rest 32% were from other sources. 40 schools received computers from other sources - 24 school received from North Eastern Council (NEC), 10 school bought on their own, 8 schools managed through donations, and 4 schools got it from MLA schemes.

Out of 67 responding schools, 50 had a computer in their office. All of them used it for typing letters, 88% used it for typing question papers, 42% used it for recording of salaries, 52% used it for recording of accounts and 64% used it for maintaining student's records.

The total number of computers in these school offices was 346, out of which 46 were from ICT@Schools scheme. Out of 51 scanners at these offices, 45 were from ICT@Schools scheme and out of 83 office printers, 46 were from ICT@Schools scheme.

Out of 68 schools, 40 schools had a library - only 13 schools had a library period in their school. Out of the 40 school, only 1 school had a computer in the library which was taken from the ICT@Schools scheme.

Out of the 71 school surveyed, 68 responded that they had a computer lab in their school. 64 schools had one room and 4 had more than one room for the computer lab. 48 school teachers responded to having access to the computer labs whenever they were free. The computer labs were mostly used for teaching regular computer classes. Students were also encouraged to use the labs for doing their project works for other subjects. Other subject teachers too used the labs to teacher their concerned subjects. Besides the above mentioned usage of the labs, 3 schools also use the labs for teaching people of the locality.

Computer classes were made compulsory according to the class levels in the school. Class level differed from one school to another. We have categorized the class levels into 5 different groups. Out of 69 schools, 67% made computer classes compulsory for classes 5 to 10. Though computer is optional in HSCL examination, these schools have made it compulsory so as to enhance the basic IT knowledge of their students. 10% of the schools have even made computer class compulsory even for class 1 students.

Table 6.6: Computer Practical

Sl. No	Particular (i.e., No. of sessions/week or No. of individual access/month)	Schools having Particular no. of sessions per week	Schools providing Particular no. of access to an individual/month
1	Zero	2	4
2	One	21	8
3	Two	26	9
4	More	20	48
	Total	**69**	**69**

When it comes to the practical session a class gets in a week, it depends on the enrollment of students in each class. 20 schools which responded as more than two times access to an individual student in a month (Table 6.6) could do so due to their lower enrollment. The figures against serial numbers 2 and 3 in table 6.6 indicate that most students get to use the computers once or at best twice a month. 2 schools did not have any practical session in their school due to absence of power supply or due to lack of adequate sitting arrangements for the students. Some other schools they did not have computer

classes as there was no teacher appointed in their school or the computer teacher did not join the school.

When it comes to accessing the computer by the students, most of the schools responded that the students get to access the computers during practical classes. It is nice to know that some schools do give students access to computer even after school hours and during holidays.

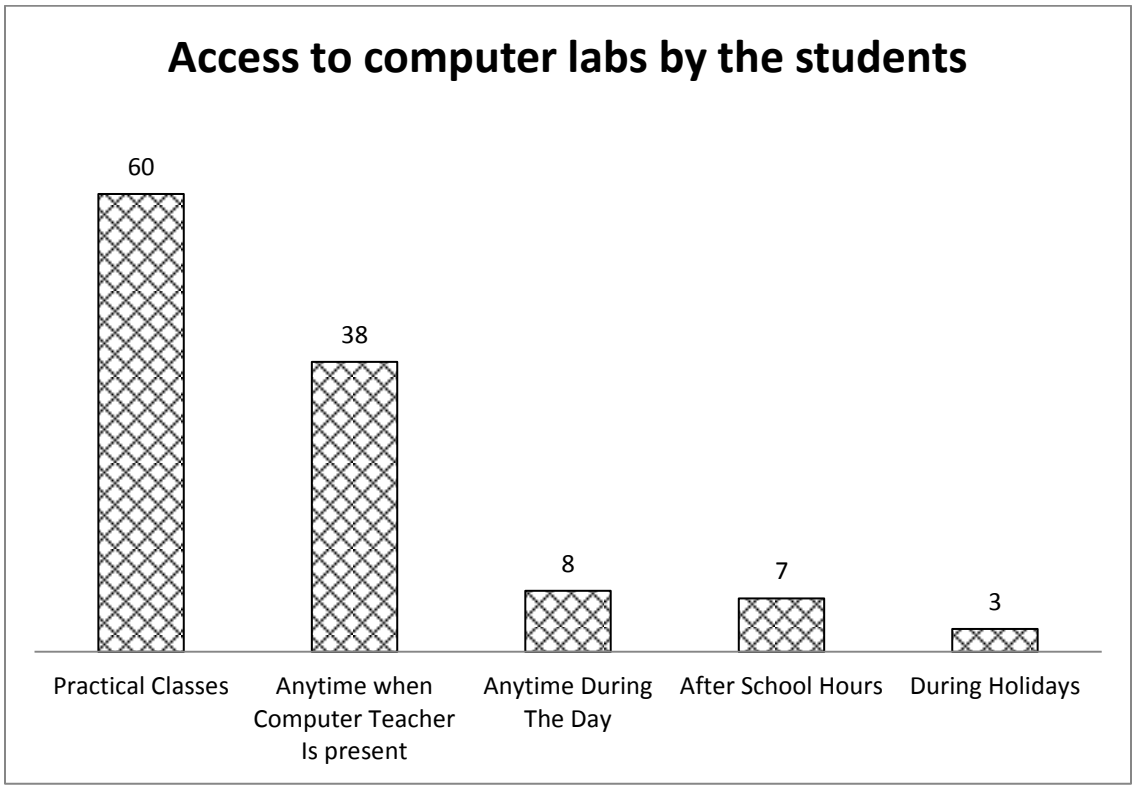


Figure 6.5: Access to computer labs by the students

Out of 69 responding schools, 57 agreed that the students' attendance has improved since the implementation of the ICT@Schools scheme, 7 schools responded that there was no improvement in student's attendance and the rest 6 schools left the query unanswered.

There was an interval between the completion of the first phase (first 10 months) of ICT@Schools scheme and the renewal of the same for another 10 months. We tried to find out as to how the schools responded vis-à-vis the computer classes during this period. Out of 62 responses, 60% of the schools continued the computer class and paid the computer teacher from the school fund. 15% of the schools continued their computer classes but the computer teacher was not paid any salary. 18% of schools discontinued their computer classes. 8% continued the computer classes with the payment of salary of the computer teacher taken care by the M/s Aces Infotech or did not have classes as it was winter vacation for their schools.

Table 6.7: Discontinuation of ICT Scheme

Sl. No	Particular	Percentage
1	Classes Were Discontinued	18
2	Classes Continued And Computer Teacher Was Unpaid	15
3	Classes Continued And Computer Teacher Was Paid By The School	60
4	Other (classes continued and paid by the ACES, winter vacation)	8
	Total	**100**

All the 69 responding schools had received educational CDs from M/s Aces Software. 3 schools received the CDs in the year 2009, 11 schools received in the year 2010 and the rest 55 schools received this year. However, as M/s Aces Software was not distributing any of these CDs in the year 2009, it seems that those who received the CDs in 2009 must have purchased those on their own.

Out of the 69 responding schools, 72% of the principal, 65% of the computer teacher, 57% of the subject teacher and 41% of the schools' students have seen the educational CDs. However, only 33% of the students have referred to these educational CDs.

Besides the CDs, the schools have got some of its own teaching aid. Out of the 69 responding schools, 92% of the schools have a globe, 94% of the schools have maps, 85% of the schools have charts, 67% of the schools have models and 16% of the schools have LCD projector and science laboratory.

Besides the teaching aids, the schools also have some other equipment. Out of 69 schools, 30 schools have public address system, 16 have internal announcement system, 14 have LCD projector and 7 even have EDUSAT facilities. 32 schools have internet facilities.

6.8. Observations

Most of the schools covered under the ICT@Schools scheme in Meghalaya fall under rural areas and are co-educational. As for the number of computer teachers in the schools surveyed, it is found that the same was too small compared to the number of students. The problems faced by the schools in conducting computer practical classes included absence of proper power supply, inadequate number of computers, lack of enough sitting arrangements in the computer labs, and absence of infrastructure for the computer rooms. The implementation of ICT@schools scheme has surely resulted in positive results towards catering to the learning needs of the students to certain extent. However, the aforesaid mentioned problems are limiting the benefits that they could have otherwise derived from the same.

Chapter 7

Balance Score Card of ICT@ 75 Schools in Meghalaya

As mentioned in chapter 4, the current evaluation of the ICT@75Schools in Meghalaya was assessed on the basis of the following indexes:

Index 1: School Receptiveness
Index 2: Computer Teacher Willingness
Index 3: Computer Teacher Competence
Index 4: Other Teachers' Willingness
Index 5: School Work Climate
Index 6: School Learning Climate
Index 7: Students' Performance
Index 8: Overall ICT Index

And these indexes are assessed on their variable impact on the basis of Location of School (District) and Nature of School Governance.

7.1. Index 1: School Receptiveness

School Receptiveness was measured using several variables which assessed the capability of the school in terms of the infrastructure available which could enable teaching and learning of the ICT as a subject and as a pedagogical tool. The purpose was to get an estimate of how much these schools are prepared to receive the ICT initiative. Usage of the existing physical and technological instruments and the actual usage which the school makes of those instruments were assessed. Receptiveness was also assessed on

the basis of the responses on questions relating to the overall usage patterns of the computers and other supporting devices which were installed in all the 75 schools under the current scheme.

In terms of the analysis of the survey data, out of the total of 75 schools a total of 50.7% of the schools can be grouped as being receptive Above the Average as compared to the average level of receptiveness of the entire pool of 75 schools. Another 40% appear to be on an Average level of readiness to receive the scheme and the remaining i.e. 9.3% either do not have the other necessary infrastructure and/or appropriate usage pattern of the already delivered computing infrastructure. The following table describes the same:

School Receptiveness		
	Frequency	**Percent**
Above Average	38	50.7
Average	30	40.0
Below Average	7	9.3
Total	75	100.0

On comparing Receptiveness of Schools located in different District Clusters, it was observed that 23.7% (N=9) of the total schools with an Above Average Receptiveness belonged to the Garo Hills cluster, along with 26.3% (N=10) of the Jaintia-Ri-Bhoi cluster and the remaining 50% (N=19) of the schools within this group were located in the Khasi Hills cluster.

With a total of 30 schools belonging to Average Receptiveness, majority schools were located in the Garo Hills (N=14), then an equal number (N=8) each both in the Jaintia-Ribhoi and Khasi Hills. Schools below the Average on the Receptiveness index, out of a total of 7 schools, 4 were located in the Garo Hills, 1 in the Jaintia-Ribhoi Cluster and the remaining 2 in the Khasi Hills Cluster.

Schools located in the Khasi Hills cluster seem to be more receptive of the scheme with almost 50% of the schools falling within above average level of receptiveness as compared to the next highest cluster of the Garo Hills.

7.2. Index 2: Computer Teacher Willingness

Another index which was computed to provide an assessment of how facilitating the intervention was to achieve the targeted objectives of the schemes was about the level of willingness to teach and provide the necessary inputs to the school and students in that school. This was assessed on the basis of an index computed to assess the level of Willingness which the Computer Teacher (originally appointed by the contracted agency and in some cases re-appointed by the schools themselves).

Out of the pool of Computer Teachers in the 75 schools, a total of 68% of the cases are reported to be high on their willingness to deliver the expectations and contribute to the cause of the scheme's objectives, as compared to 32% who seem to be on an Average level and there were none who could be placed on any below. Overall it appears that the majority of the people who were entrusted with the responsibility of being the Computer Teacher have performed well. The same is evident in the table below:

Computer Teacher Willingness		
	Frequency	Percent
Above Average	51	68.0
Average	24	32.0
Total	75	100.0

7.3. Index 3: Computer Teacher Competence

Besides the Willingness to be a Computer Teacher, the level of Competence to be able to deliver up to the expectations of all the significant others – self, students, and the school is of equal importance. The level of Teacher Competence was assessed by using a self reporting test of computer knowledge and skills. The test was developed containing questions which could provide an assessment of how much the person is actually able to comprehend and solve routine computing problems and resolve them on his own.

Out of the 75 schools, at least 17.3% Computer Teachers assessed to be Above Average on their computing ability and helping children learn about the same. A majority 56% of the total computer teachers was assessed to be at an Average competence level and the remaining 26.7% were Below Average.

Computer Teacher Competence		
	Frequency	Percent
Above Average	13	17.3
Average	42	56.0
Below Average	20	26.7
Total	75	100.0

7.4. Index 4: Other Teachers' Willingness

It is understood that as part of the ICT@Schools initiative and the larger understanding of how an intervention could be facilitated better, the extent of Willingness of the Other School Teachers' is of utmost importance. Until and unless these teachers are ready and willing to adapt to the new technology and have the necessary initiative to experiment the same in their subject teaching, the scheme would not reach its desired objectives.

Assessing Other Teachers' on their Willingness to receive the ICT intervention, a high percentage of teachers i.e. 54.7% were above average on their level of willingness to adapt and adopt the given technology in their teaching. Another 29.3% of the total Other Teachers in the given schools are grouped as Average and another 16% Below Average.

Other Teachers' Willingness		
	Frequency	Percent
Above Average	41	54.7
Average	22	29.3
Below Average	12	16.0
Total	75	100.0

7.5. Index 5: School Work Climate

Willingness of the Other Teachers' coupled with the Competence and Willingness of the assigned Computer Teachers in the given school would need an appropriate enabling environment for them to perform their duties and the additional effort and initiative expected of them to make the scheme succeed. Such an environment for all the school teachers would be that of the Work Climate in the context of the school in which they are employed.

On questions relating to how they perceive the working conditions and the congeniality of the peers and the administration, a total of a significant 58.7% of the teachers across all the 75 schools perceive their work environment to be Above average. 32% have reported to working in an environment just Average as compared to all the other Schools and another 9.3% of the teachers of the respective schools have reported the Climate to be Below Average.

School Work Climate		
	Frequency	Percent
Above Average	44	58.7
Average	24	32.0
Below Average	7	9.3
Total	75	100.0

7.6. Index 6: School Learning Climate

As an outcome variable which could speak of the level of achievement of the stated scheme objective, the index of School Learning Climate provides an understanding of enabling the climate for learning is for the children in the schools. The assumption behind computing this index was that real learning in children (and also in adults) takes place through self-exploration of subjects and the peer group. The students in all the surveyed schools were asked about their perception of various elements of schools' learning climate.

A total of 61.3% of the children in schools reported to have the required Above Average Learning Climate as compared to all the attended schools. 24% reported their learning climate to be Average and another 14.7% reported it to be Below Average. The table reflects the same:

School Learning Climate		
	Frequency	**Percent**
Above Average	46	61.3
Average	18	24.0
Below Average	11	14.7
Total	75	100.0

7.7. Index 7: Students' Performance

Students' Performance on two different tests were assessed on the basis of objective questions relating to basic understanding of the subjects of arithmetic, science, geography and social science also that of computers. The questions were so formulated to get an assessment of the level of understanding of concepts and their application. While the same questionnaire was distributed to the students of all class levels, the score was normalized based on the expected level of knowledge of students of various class groups.

Out of the 1099 students surveyed across 75 schools, after averaging their performances across schools a total of 14.7% of the performances of the school students were above average, as compared to 42.7% each of average and below average performances, respectively. Interestingly, the same set of students scored almost similar levels of performance and distribution on their performance on the understanding of Computers.

Students' Performance				
	Other Subjects		Computers	
	Frequency	Percent	Frequency	Percent
Above Average	11	14.7	9	12.0
Average	32	42.7	34	45.3
Below Average	32	42.7	32	42.7
Total	75	100	75	100

7.8. Index 8: Overall ICT Index

Totaling all the above indexes provided us an estimate of the extent of success of the ICT Scheme in all the chosen 75 schools of Meghalaya. This composite index was calculated on the basis of how each of the schools had performed on each of the sub-indexes and their overall impact on the overall ICT Scheme Index. When observed at the macro level, the index provides an estimate of the overall performance of the scheme across all schools as compared within themselves.

When plotted on an average of performance of all the schools on each of the sub-indexes, an almost equal percent of schools i.e. 33% can grouped with 25 schools Above Average, another 25 Average and the remaining were Below Average (including 3, whose scores could not be computed for lack of sufficient data/not reporting).

ICT Scheme Index		
	Frequency	Percent
Above Average	25	33.3
Average	25	33.3
Below Average	22	29.3
Total	72	96.0
Missing	3	4.0
Total	75	100.0

Chapter 8

Content Analysis of The Learning Materials

M/s Aces Infotech provided a set of six CDs to every school as per the contract. A set of these CDs were procured for evaluation. These CDs covered the following subjects:

- Mathematics
- General Knowledge
- Physics
- Biology
- English
- Chemistry

The observations are as follows:

- Accept for the CD of General Knowledge, the materials provided are not interactive. In fact, in most of the chapters the text is seen on the screen and a voice just reads the text as it is.

- In the CD containing course materials for mathematics, there are problems so far as placement of equations is concerned.

- Each of these CDs contains a root folder under which there are several sub-folders containing one chapter each of the curriculum for different classes. These folders are not indexed, and are arranged in haphazard manner – thus while the first one is a chapter of class X, the next one

might be one of class IX, and this might again be followed by another one of class X. Thus, searching for the material one is looking for is difficult and the process is not user friendly.

- In some exceptional cases, there are a few animations included in the material. However, they are too simplistic and do not facilitate the understanding of the students in any significant way. Even in case of a chemical reaction which is shown through an animation, the changes in colors are told in the background, and not seen in the animation. In some cases, a click on 'Play animation' button did not result in anything.

The course materials included does not cover all the classes under the contract:

- Mathematics CD contains materials for classes VII onwards. The total number of chapters contained in this CD is 47.
- Physics CD contains materials for classes IX onwards. The total number of chapters contained in this CD is 34.
- Biology CD contains materials from classes VII onwards. The total number of chapters contained in this CD is 44.
- The total number of chapters contained in the English CD is 23.
- Chemistry CD contains materials from classes IX onwards. The total number of chapters contained in this CD is 27.

One of the prime objectives of ICT@schools is to bring in a new pedagogy, and the ICT enabled content can be one way forward towards this objective. The educational CDs can contain animations, videos, movies, etc. to provide a true multimedia experience to the students – assisting the teachers to provide a realistic experience to the students as well as to hone their concepts about the subject taught. However, the educational CDs provided to the schools hardly are capable of igniting any additional interest amongst the students, and have just become a poor supplement of the text book. Instead of reading the books, they can now listen to the same. The power of multimedia in enhancing the students' experience has thus not been used.

Chapter 9

Some suggestions On Going Forward

Technospeak

Ten months is too small a time for an intervention as ambitious as ICT@Schools to bear fruits. The problem is further supplemented by the hostile terrain of the area of implementation. Out of the 75 chosen schools, there are those which do not have any motor-able road connectivity, and one needs to walk for hours to reach them. Even for those which do have roads, some of these can be reached only via a heavy vehicle or at least a SUV. The Government as well as the implementation agency must be appreciated forhaving been able to reach the computers to these 75 schools.

Apart from the statistical evaluation provided in the previous chapter, here we provide our observations on certain other features of implementation of this project. We also provide a suggested model for implementation towards the end of this chapter.

9.1. Educational CDs

Aces Infotech provided a set of six CDs to every school as per the contract. However, as mentioned earlier, these are only a poor replacement of the text books. The main advantage of using a digital media is to incorporate the power of multimedia – which has hardly been done in these CDs. Hence once cannot expect any change in the pedagogy with the utilization of these CDs.

One way forward might be to delink the educational CD vendor and the ICT project implementation partner. Independent of the implementation partner, educational CDs from different vendors may be evaluated, and the ones which might help the students to understand the concepts better may be

selected to be used at the schools. Attention should be given to provide due multimedia experience to the students. Teachers from the schools, even from the remote rural ones, should ideally be involved in making the selection – this way the teachers will also appreciate the expanse of ICT educational tools available and might also get convinced that these tools can in effect, make their job easier and interesting.

9.2. State Institute of Educational Technology

In other states where SIET has become operational, the SIET is providing leadership in making available the educational resources for benefiting from the ICT infrastructure at schools. These include TV programs beamed by DD, development of CDs on various subjects which are even available to the students for purchase, organize seminars and workshops to bring in subject experts, media experts and teachers to enhance the quality of audio-video material being developed by them. While some SIET seem to have achieved considerable success in the role provided to them, some others seemed to have lagged behind.

To leapfrog the initiative of ICT becoming a medium for enriching existing curriculum and pedagogy, an alternative could be to evaluate the offerings of other SIETs in terms of the quality of their E-resources, and adopting the same with necessary modifications in the state, instead of trying to re-invent the wheel all over again. However, there is still a need to plan the delivery of E-resources and monitor their use at the state level. Another important point is that just providing the e-resources will not ensure their usage. Motivation and training of the teachers is a prime requirement to ensure the desired use of these resources.

This makes it imperative that a state level body (a SIET or otherwise) with the necessary expertise and resources be entrusted with these responsibilities. There is also a need to develop/modify contents based on local environment to be beamed through TV to attract the attention of the rural audience – who may find it difficult to grasp English resources. It has been found during survey that the students found it difficult to understand English, though all their books are in English. Thus, the online content, if presented in English, will not have the desired level of impact amongst the students. Translation of resources might therefore be a very important component of taking these resources to the end user and ensuring that they benefit from the same.

9.3. The true role of ICT@Schools

“ICT at education really imply paradigm shift in learning models. It is not about doing the same thing we do using IT. It is about doing different things that we don’t do today using IT” – Sam Pitroda

Thus, we are really talking about different and new learning models. This is not the same as a formal education in Computer Applications through a board syllabus. It might be beneficial to separate out Computer Application course from ICT@schools. Instead of burdening the unwilling students to learn Computer Applications (using 10 computers to teach a large number of students the tricks of Computer Applications is resulting in 'boring' notes being handed out in computer classes to be mugged up by the taught), ICT should be integrated in teaching of the regular subjects. This will even out, to some extent at least, the difference in quality of teachers across the urban and rural schools. The teachers need to be enlightened about usage of ICT in teaching their own subjects in terms of using movies, video content, slides, etc.

9.4. Leading by Example

Development of SMART School as envisaged in the original scheme document must be looked into. To allow the teachers to perceive that a e-learning model is possible, it is important to give them a feel of the actual system. The SMART schools can make a difference in this area. However, it might be better to develop an average school running under the state board into a SMART school. This will allow the other school teachers from similar school perceive that whatever is happening in that SMART school is also very much possible in their own schools, albeit with some innovation. If KVS or NVS sets up the SMART school, this perception of 'can-do' may not come in – since they work under different funding pattern and under different control system.

9.5. New Vistas in Pedagogy

The important objective behind the ICT@school scheme is to bring in change in curriculum and pedagogy. Thus, all the teachers of the schools need to be made aware of new pedagogy models made possible through use of ICT. This needs intervention in terms of training. The teachers appointed by Aces Software may not be competent enough to bring to the other teachers the power that ICT provided in terms of new pedagogical approach. Thus, training may be organized (in quick cycles of short workshops) at state/district headquarters for the teachers by trainers who have the capability to bring forth to the taught the advantage of using ICT as teaching medium.

9.6. Project Duration for Implementation

The contract with Aces Infotech was for duration of 10 months. The duration of 10 months was calculated in terms of one academic session. While appointing teachers for academic session may be construed as good idea – there are inherent problems in that calculation. There are regions in the state where the session starts after the winter vacation in February and runs for ten months till November – the ten months contract period may seem to work for these. However, there are also schools where

sessions start from February and ending in December with summer vacation in June/July – thus a ten months contract in these cases will not work unless the contract specified that the teachers will not be paid for the summer/winter vacation that falls within the session.

9.7. Internet Experience without connectivity

There are very few schools which have got Internet connectivity as of now – while 31 schools have responded to have Internet connectivity – the bandwidth and reliability of the same is still very much debatable. To spread the use of ICT in schools and to provide the students with the tools for this new millennium, simulated Internet environment can be provided in an Intranet. This will enable the students to experience Internet experience, even in the absence of any connectivity. Students and teachers can be facilitated to send emails within the intranet. To start with, the students and teachers may be encouraged to send emails instead of paper leave applications. Setting up of the Intranet with emails can be done using open-source software, thus will not require any additional investment. The educational ICT contents may also be hosted in the intranet, so that the students can access the same as it can be done in the Internet. Even search engines like Google have their intranet solutions, and it might be possible to convince Google, for example, to allow the usage of the same at the schools without any cost as a social initiative.

9.8. Cutting on Licensing Cost

With licensing and cost being an issue, open source as an option must be explored properly. This will not only reduce the cost of the project, but will also build up a skilled force comfortable with open source software. This will enhance the use of open source products in business and administration in periods to come, providing a long term solution to the complex issue of software licensing.

9.9. A Possible Model for implementation

9.9.1. Problems of student-teacher ratio

With the computer classes compulsory in most of the schools for classes V to VIII, there are many students in each class. The problem becomes pronounced in the lab, especially with only 10 computers in the lab, which restricts access to students.

One way to overcome this problem is to teach a group of senior students (or a smaller group of senior students) the usage of word processor, spreadsheet, etc. and allow them in turn to teach the younger

ones. This way, there will be more 'teachers' to take care of the younger ones, while at the same time enhancing the knowledge and skills of the senior students[1].

9.9.2. Increase scope for hands-on and enhance usage

To allow enhanced usage and learning of computer among the students, it might be better to allow a group of students to have the ownership of the lab. This ownership can be rotated amongst various groups. They can take care of the upkeep and usage of the lab. This will ensure that the lab will be available to the students beyond school hours. With enhanced usage, especially under the control and supervision of students, minor wear and tear of the systems will be inevitable and should be accepted.

To ensure that there is knowledge transfer amongst the students, this activity of teaching junior students can be made a part of the curriculum – for example, an activity under SUPW which can be evaluated, and due credit awarded to the deserving students.

9.9.3. Generate Interest to Encourage Self-Learning

It is important not only to teach the subject, but also to teach how to learn by oneself. The first step towards spreading ICT education is to generate the desired interest amongst the students. As mentioned earlier, this can be done by selecting interactive course materials which are interesting for the students. The best way is to provide interactive course materials in science, mathematics, social studies, languages, etc. without adding the burden of another formal subject (Computer Applications) on the students. Once the students get interest and realize the benefit of the interactive course materials, they would try to spend additional time on those on their own. Even interactive computer games which enhance learning in any particular area should be encouraged. This will make learning a fun for the students.

In the next stage, group projects based on these course materials might be given, and students be encouraged to submit them online (as mentioned earlier, this can be done using an Intranet system which will emulate the Internet for all practical purposes). This will motivate the students to learn word

[1] One of the places where this has been tried out is St. Anthony's College, Shillong. At that college, a club of computer science students – the Cyber Club – conducts one to two months computer courses for other students of the college and train them in word processing, using spreadsheet, etc. every year. Over the year this has become a much sought after course, and sometimes the demand for these courses is higher than the similar computer literacy courses conducted once in a year by the faculty of the computer science department. The reasons for the popularity are low fees and access to 'teacher'. With about five to ten 'teachers' conducting the classes, the students get much more personal attention and supervisions. For the students who successfully complete the course and have been regular with their attendances are refunded most of the fees paid at the beginning of the course.

processors. The students may be provided with a preliminary idea about the word processor, letting them to pick up the tricks on their own using the online help as per their requirements.

If these projects are so provided that they require charts, the students will be motivated to experiment with spreadsheet. Once again, they can be provided a primer, and encouraging them to learn other tricks on their own.

9.9.4. Teachers' motivation

For long term sustainability of this project, it is important to transfer the knowhow of computer and computer aided education to the other teachers of the school. The scheme envisages teaching the same to at least three teachers in every school. While this is very much possible on paper, there is a question of the motivation of the learners (i.e., the school teachers). In the absence of any incentive, there might be a feeling that learning computers will increase their work load as they would be expected to teach computers in addition to their regular subjects.

As incentive scheme may therefore be developed which could enhance the sustainability of the project in the long run. An independent certifying agency – may be in the form of a local college – could be set up, and the school teachers will have the option to sit for the certifying examination at the certifying agency at any-time/pre-defined time. An examination fee may be ascertained to take care of the cost and incentive for the certifying agency. While any teacher could be allowed to sit for the examination at their own cost, the ones deputed by the schools (three per school) might be allowed to sit for free. The certificate might be awarded jointly by the certifying agency and the Government of Meghalaya – this will provide some incentive for the teachers to learn computers. To add to the incentive, those qualifying with a high score might be provided with a one-time cash award. At a later stage, different levels for these examinations can be introduced.

A scheme like above may motivate enough teachers to come forward and learn computers. This will also allow the Government to develop a database of the teachers with necessary computer skills, and who can be entrusted to take the project forward once the implementing agency moves out of the system. The one-time cash incentive, motivating teachers to learn on their own, might actually allow the training of teachers at a lower cost. If a similar training program is run by the Government for the teachers, a lot more investment might be required and further, that would be without any guaranteed results. In the above scheme, the award is provided only to the successful ones.

A proper teaching model will be able to encourage and motivate the student to learn the usage of ICT and the skills for the new millennium; while a faulty system will generate an enigma towards computer and its applications.

It is not necessary that the state of Meghalaya should be a follower – and should try to implement the scheme as done in other parts of the country. While the detail guidelines are set by the Union Government, there would still be ample scope to experiment – and if successful, such processes may be replicated at the other parts of the country.

9.10. Overcoming Operational Issues of Implementation

There is a considerable gap between policy rhetoric and effective project implementation. Even as ICT-in-education projects increase rapidly in number and scope across the continent, many still lack necessary pre-project assessments, enumerated goals for outcomes, or understanding of what technology can and cannot do.

Education is seen as a primary mechanism through which ICT can empower individuals, communities, and societies to develop technologically literate workforces that are able to participate in the information society and economy of the present and future. As such, it has been a key target of ICT-for-development initiatives.

Education is believed to play an essential role in the development of a knowledge-based society. The rationale is that education is a powerful tool that contributes seminally to economic growth through the development of the skilled workforce necessary to increase productivity. It is equally vital to social development, as it empowers people to improve their health, environment, and governance. Despite the soundness of theory, a sizable number of recent ICT-focused developing world education initiatives have failed to produce ecosystems of technology adoption or uptake in the classroom; in addition, follow-up and measurement of outcomes from these projects too often remains undone. Thus, questions remain regarding how to best pursue successful and sustainable ICT-for-education projects. Understanding how and when to use technology appropriately to improve the educational experience and ultimately develop a workforce literate in, and prepared to contribute to, the knowledge economy remains an unaddressed challenge.

Given the rapid rate at which ICT projects can be designed and implemented, there is a tendency to see ICT as a short-term silver bullet that will be adopted instantly on a wide scale, bringing immediate solutions to past and present hindrances to political, social, and economic growth. Few governments, or project implementers for that matter, realize the level and duration of macro-scale commitment necessary for ICT to be adopted by numbers sufficient to enable widespread change. A failure to conceive of ICT-in-education projects as long-term infrastructural and human capital investments more often than not leads to both an under commitment of funds and overly high expectations for quick results. There is also an often-held misconception that ICT is an end in itself, or that simply distributing computers will create a need for them, a comprehension of their technology, and a technologically

literate populace. Further, societies simply do not change as quickly as the technologies introduced into them do, or even at the rate that these technologies might allow or enable. All these factors can lead to unrealistic expectations, creating a gap between aspirations and outcomes. Despite the promise that today's new technologies hold, the unplanned introduction of ICT—without a realistic understanding of what technology can and cannot do, or of which capabilities it may enhance—can intensify existing inequalities in society and lead to disappointments. Projects that do not succeed will represent unfulfilled aspirations for the participants, as well as the squandering of scarce resources for developing country governments. The stakes are high.

One of the challenges facing many well intentioned ICT-for-education projects is that such projects have traditionally failed to anticipate the importance of such considerations as teacher training, educational outcomes, infrastructural requirements, and the like; in other words, many fail to take a holistic approach to the adoption of the technology. And yet, it is becoming widely recognized that, in order to promote uptake, adoption, and a culture of use (i.e., to achieve sustainable outcomes), a focus that includes the entire ecosystem of a project is necessary. Further challenges include both performing a truthful assessment of the conditions into which ICT is introduced and enumerating realistic goals that the use of ICT is anticipated to achieve.

ICT cannot be a solution if the source of the problem has not been thoughtfully and honestly articulated. For example, if there is no universal education in a country, there is a reason, and it has nothing to do with whether there are computers in the classroom. There may be no classrooms. There may be no teachers. The prevailing social, economic, political, or even infrastructural conditions may not allow parents to send their children to school. None of these issues will be addressed or solved by handing out computers. Technology that will lead to meaningful development cannot be an answer in search of a question. It must be the other way around. This is by no means exclusive to Meghalaya—it is relevant all over the globe.

One of the shortcomings of the leapfrogging argument so often alluded to when describing the potential for ICT vis-à-vis development is that it tends to focus solely on the technology, missing the human element of meaningful ICT use. Merely providing technology does not automatically create a need for it, nor does it foster a culture of use or attempt to comprehend the underlying issues and challenges most efficiently addressed with the aid of technology. It has become an axiom among those who study and deploy ICT that technology is "neutral." This view ignores the fact that technology is always and everywhere introduced into a society that is far from neutral; the individual characteristics of each society greatly affect fundamental issues, such as whether and how technology will be adopted and used, and who will benefit from it.

9.11. Managing Project Implementation

Project management is both people and technical oriented. It involves understanding the cause-effect relationships and interactions among the socio-technical dimensions of projects. Improved competency in these dimensions will greatly enhance competitive edge in implementing any project. It provides people with a powerful set of tools that improves their ability to plan, implement, and manage activities to accomplish specific organizational objectives.

The term program and project are often used interchangeably in practice, which sometimes causes confusion. Programs and projects are similar in the sense that they both are directed towards goals require plans and resources to reach their goals. Both use similar tools, methods, and policies. The difference lies primarily in scope and time horizon. A program is a series of coordinated, related, multiple projects that continue over extended time intended to achieve a goal. A program is a higher level group of projects targeted at a common goal. ICT@ Schools is a program that needs to be implemented with the help of project management approach for proper implementation.

Project management is no longer a special-need management. It is rapidly becoming a standard way of managing any business or organizations or program implementation. Today, emphasis is on development of an integrated project management process that focuses all project effort toward the strategic plan of the organization and reinforces mastery of both the project management tools/techniques and the interpersonal skills necessary to orchestrate successful project completion.

There are two dimensions within the project management process. The first dimension is the technical side of the management process, which consists of the formal, disciplined, pure logic parts of the process. The technical side relies on the formal information system available. This dimension includes planning, scheduling and controlling projects. Clear project scope statements are written to link the project and its deliverables and to facilitate planning and control. Creation of the deliverables and work breakdown structure facilitate planning and monitoring the progress of the project. The work breakdown structure serves as a database that links all levels in the organization, major deliverables, and all work – right down to the tasks in work packages. The integrated information approach can provide all stakeholders with decision information appropriate to their levels and needs.

The second dimension is the socio-cultural side of the project management process. In contrast with the orderly world of project planning, this dimension involves the much messier, often contradictory and paradoxical world of implementation. It centers on creating a temporary social system within a larger organizational environment that combines the talents of a divergent set of professionals working to complete the projects. This dimension also involves managing the interface between the project and external environment.

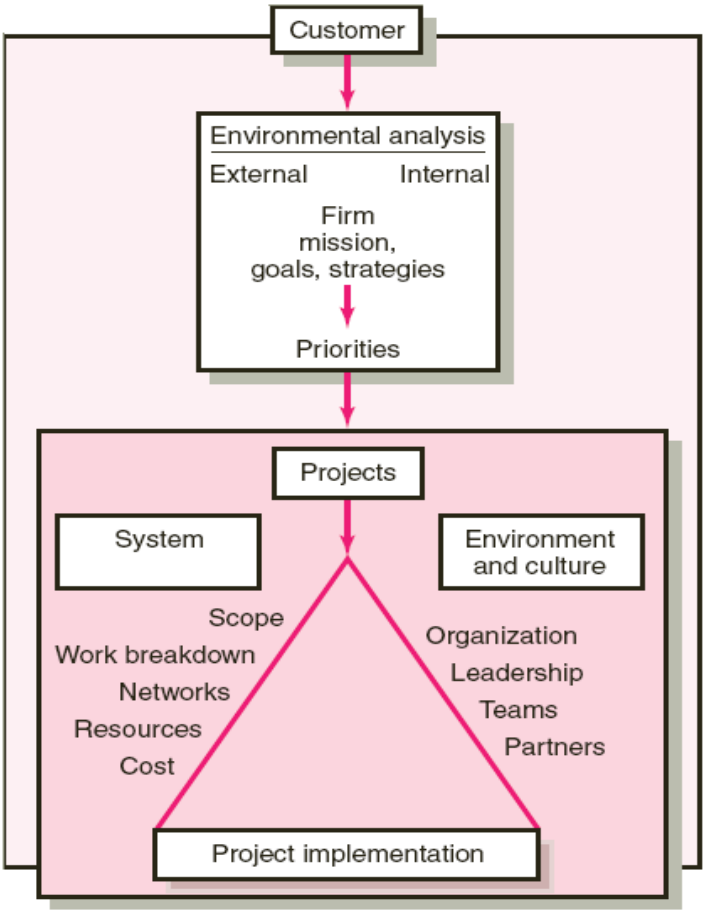


Figure 9.1: Integrated Management of Projects

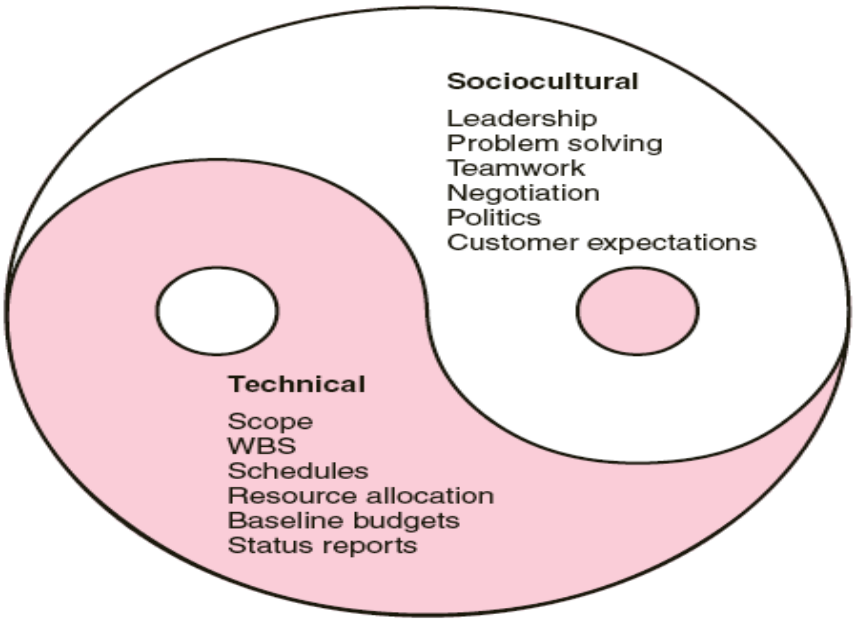


Figure 9.2: Technical and Socio-cultural Dimensions of the Project Management Process

9.11.1. Appropriateness of Project Management

Cleland and King list five general criteria for determining when to use project management techniques and organization:

- Unfamiliarity
- Magnitude of the effort
- Changing Environment
- Interrelatedness
- Reputation of the organization.

The Project Implementation Plan describes the strategy involved in preparing the end users and the target product, service, or system into daily use. This can include introducing a new product into the marketplace for customer consumption, installing and propagating a new technology, or carrying out a new process/business line or implementing a government scheme. The objective of producing an Implementation Plan is to reduce risk of implementation failure by planning the impact to the business when the product, service, or system is implemented. Its intent is to have a centralized reference document that organizes all of the information needed for implementation (i.e., identifies all the tasks that must be completed and the responsible parties that must be involved to implement the project successfully).

The Project Implementation Plan is a master plan that summarizes all of the individual plans to be performed to implement the project. These plans may be documented as part of the implementation plan or as separate project plans, depending on the type, complexity, and size of the project.

The planners and implementers (communities and their enablers) should decide on how they are going to implement a project, which is the strategy. Agreeing on the strategy involves determining all items (inputs) that are needed to carry out the project, defining the different groups or individuals and their particular roles they are to play in the project. These groups and individuals that undertake particular roles in the project are called "actors". Generating the structures and strategies therefore involves:

- Discussing and agreeing on the activities to be undertaken during implementation;
- Defining the different actors inside and outside the community, and their roles; and
- Defining and distributing costs and materials necessary to implement the project.

After establishing the appropriateness of the decisions, the executive should discuss and agree with all actors on how the project will be implemented. This is called designing a work plan. (How do we get

what we want?). A work plan is a description of the necessary activities set out in stages, with rough indication of the timing. In order to draw a good work plan, the implementors should:

- List all the tasks required to implement a project;
- Put the tasks in the order in which they will be implemented;
- Show allocation of the responsibilities to the actors; and
- Give the timing of each activity.

The work plan is a guide to project implementation and a basis for project monitoring. It therefore helps to:

- Finish the project in time;
- Do the right things in the right order;
- Identify who will be responsible for what activity; and
- Determine when to start project implementation.

The implementers and planners have to agree on monitoring indicators. Monitoring indicators are quantitative and qualitative signs (criteria) for measuring or assessing the achievement of project activities and objectives. The indicators will show the extent to which the objectives of every activity have been achieved. Monitoring indicators should be explicit, pertinent and objectively verifiable. Monitoring Indicators are of four types, namely;

- Input indicators: describe what goes on in the project (eg number of computers brought on site and amount of money spent);
- Output indicators: describe the project activity (eg number of classrooms built);
- Outcome indicators: describe the product of the activity (eg number of pupils attending the school); and
- Impact indicators: measure change in conditions of the community (eg reduced illiteracy in the community).

Writing down the structures and strategies helps in project monitoring because they specify what will be done during project implementation. Planning must indicate what should be monitored, who should monitor, and how monitoring should be undertaken.

Implementation is the stage where all the planned activities are put into action. Before the implementation of a project, the implementors (spearheaded by the project committee or executive) should identify their strength and weaknesses (internal forces), opportunities and threats (external forces).

The strength and opportunities are positive forces that should be exploited to efficiently implement a project. The weaknesses and threats are hindrances that can hamper project implementation. The implementers should ensure that they devise means of overcoming them.

Monitoring is important at this implementation phase to ensure that the project is implemented as per the schedule. This is a continuous process that should be put in place before project implementation starts.

As such, the monitoring activities should appear on the work plan and should involve all stake holders. If activities are not going on well, arrangements should be made to identify the problem so that they can be corrected.

Monitoring is also important to ensure that activities are implemented as planned. This helps the implementers to measure how well they are achieving their targets. This is based on the understanding that the process through which a project is implemented has a lot of effect on its use, operation and maintenance.

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Appendix 1:

Balanced Scorecard

ICT@Schools, Meghalaya

Balanced Score Card (Sorted on the basis of overall performance)

School Id No	School Name	District	Nature of School Governance	School Receptiveness Index	Computer Teacher's Willingness Index	Computer Teacher's Competence Index	Other Teachers' Willingness Index	School Work Climate Index	School Learning Climate Index	Students' Performance Index	Overal Index Score	Difference in Performance (in index Points)	Overall ICT Index
23	Sacred Heart Higher Secondary School	East Garo Hills	Govt Aided								563	110.5	
71	St. Anthony School	East Khasi Hills	Deficit								542	89.5	
60	Laitumkhrah Presbyterian Higher Secondary School	East Khasi Hills	Deficit								535	82.5	
54	Lummu roo sec. school	Jaintia Hills	Community								521	68.5	
63	St. Gabrial's H/sec School	East Khasi Hills	Deficit								516	63.5	
74	St. John Bosco Higher Secondary School	East Khasi Hills	Deficit								514	61.5	
55	Raliang Raij sec.school	Jaintia Hills	Govt Aided								512	59.5	
61	Tynring Presbyterian Higher Secondary School	East Khasi Hills	Govt Aided								511	58.5	
72	Mahatma Gandhi Secondary School	East Khasi Hills	Govt Aided								511	58.5	
64	Umlyngka Presbyterian sec School	East Khasi Hills	Any other								510	57.5	
46	St. Mary Mazzaullo Girls h/sec School	Jaintia Hills	Deficit								499	46.5	
75	St. Ursla Border Area Higher Secondary School	East Khasi Hills	Govt Aided								499	46.5	
30	Joel Gatphoh Memorial Synod Sec School	West Khasi Hills	Missionary funded								494	41.5	
42	Umling Sec School	Ri- bhoi	Govt.								492	39.5	
66	Annie Margaret Barr Sec School	East Khasi Hills	Deficit								489	36.5	
56	Tluh Secondary School	Jaintia Hills	Deficit								487	34.5	
67	Sohiong Sec School	East Khasi Hills	Govt Aided								486	33.5	
59	Savio Secondary School	East Khasi Hills	Deficit								485	32.5	
2	St Mary's Sec School	West Garo Hills	Missionary funded								484	31.5	
27	Greenyard Sec School	East Garo Hills	Govt Aided								483	30.5	
41	Kynjoin Umran Presbyterian Sec School	Ri- bhoi	Any other								482	29.5	
28	Balang Mawlangwar Sec School	West Khasi Hills	Govt Aided								479	26.5	
47	Little flower Sec School	Jaintia Hills	Any other								476	23.5	
50	St. Joseph' Sec School	Jaintia Hills	Deficit								476	23.5	
58	Shillong Academy	East Khasi Hills	Govt Aided								476	23.5	
1	Christain Boys H School	West Garo Hills	Any other								475	22.5	
73	Maurice Patrick King Memorial Laitryngew High School	East Khasi Hills	Govt Aided								472	19.5	
49	Rymbai Presbyterian H/sec School	Jaintia Hills	Govt Aided								470	17.5	
68	Diengiei Sec School	East Khasi Hills	Govt Aided								470	17.5	
17	Gimegiri Secondary School	West Garo Hills	Deficit								467	14.5	
62	Unitarian Sec School	East Khasi Hills	Govt Aided								466	13.5	
40	Umtasor Mawdkhar Sec School	Ri- bhoi	N.A.								466	13.5	
37	St. Joseph' Sec School	West Khasi Hills	Any other								463	10.5	
70	Mawdon Mawpen Presbyterian Higher Secondary School	East Khasi Hills	Govt Aided								463	10.5	
51	Ka Syiem Jingsuk Sec.School	Jaintia Hills	Missionary funded								454	1.5	
38	Pastorate Laitkseh Christian Sec School	West Khasi Hills	Any other								453	0.5	
29	k.J.P. Synod Sepngi H/S School	West Khasi Hills	Any other								452	-0.5	
31	Tirot Sing Memorial Sec School	West Khasi Hills	Society								452	-0.5	
53	Khad ar Nor Proceeding Sec.school	Jaintia Hills	Govt Aided								451	-1.5	
43	Umpathaw Presbyterian Sec School	Ri- bhoi	Govt Aided								449	-3.5	
24	Raja Apal Secondary School	East Garo Hills	Govt Aided								447	-5.5	
11	Monabari Secondary School	West Garo Hills	Govt Aided								444	-8.5	
14	Jawaharlal Nehru Higher Secondary School	West Garo Hills	Deficit								438	-14.5	
6	Rohonpara Deficit sec School	West Garo Hills	Deficit								435	-17.5	
4	Chenggapara Sec. School	West Garo Hills	Govt Aided								423	-29.5	
45	Jowai Presbyterian Secondary School	Jaintia Hills	Any other								422	-30.5	
18	Karukol Secondary School	South Garo Hills	Govt Aided								404	-48.5	
19	Gasuapara Secondary School	South Garo Hills	Govt Aided								402	-50.5	
65	Holy cross School	East Khasi Hills	Missionary funded								400	-52.5	
7	Gonchudare Sec Schol	West Garo Hills	Govt Aided								391	-61.5	
5	Bolchugu Sec. School	West Garo Hills	Govt Aided								381	-71.5	
20	Rongara Deficit Secondary School	South Garo Hills	Deficit								375	-77.5	
12	Sulgari Secondary School	West Garo Hills	N.A.								374	-78.5	
32	Manai Sec School	West Khasi Hills	Any other								373	-79.5	
39	Nongbah Myrdon Sec. School	Ri- bhoi	Community								370	-82.5	
22	Vidya Mandir Secondary School	East Garo Hills	Govt Aided								355	-97.5	
33	Aradonga Sec School	West Khasi Hills	Deficit								347	-105.5	
25	Mangsang Secondary School	East Garo Hills	Deficit								345	-107.5	
69	St Peter Sec School	East Khasi Hills	N.A.								344	-108.5	
34	Mallangkona Govt. H/Sec School	West Khasi Hills	Govt.								340	-112.5	
15	Kalchengpara Secondary School	West Garo Hills	Govt Aided								330	-122.5	
10	Betasing H/S School	West Garo Hills	Govt Aided								323	-129.5	
44	St. Peters Secondary School	Ri- bhoi	Any other								312	-140.5	
26	Mendipather, Sec School	East Garo Hills	Deficit								308	-144.5	
21	Rongrikimgiri Secondary School	South Garo Hills	Any other								299	-153.5	
9	Mahendraganj Deficit Sec School	West Garo Hills	Deficit								270	-182.5	
8	Abdul Gofur Memorial Sec School	West Garo Hills	Govt Aided								236	-216.5	
57	Biate Secondary School	Jaintia Hills	Govt Aided								186	-266.5	
52	St. Dominic Hr.Sec.School, Mawkyndung	Jaintia Hills	Deficit								170	-282.5	
13	Zikabari H S School	West Garo Hills	N.A.								148	-304.5	
35	Jingiati Sec School	West Khasi Hills	Govt Aided								118	-334.5	
16	Tikrikilla Higher Secondary School	West Garo Hills	Deficit								93	-359.5	
3	Rongram Sec School	West Garo Hills	N.A.								0	Not Computed	
36	Indra Gandhi Mem Sec School	West Khasi Hills	N.A.								0	Not Computed	
48	Rymbai Govt Sec School	Jaintia Hills	N.A.								0	Not Computed	

Legends: Above Average | Average | Below Average | Not Computed | Not Computed/Insufficient Data

ICT@Schools, Meghalaya

Balanced Score Card (Sorted on the basis of the Districts)

School Id No	School Name	District	Nature of School Governance	School Receptiveness Index	Computer Teacher's Willingness Index	Computer Teacher's Competence Index	Other Teachers' Willingness Index	School Work Climate Index	School Learning Climate Index	Students' Performance Index	Overal Index Score	Difference in Performance (in index Points)	Overall ICT Index
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24	Raja Apal Secondary School	East Garo Hills	Govt Aided								447	-5.5	
22	Vidya Mandir Secondary School	East Garo Hills	Govt Aided								355	-97.5	
25	Mangsang Secondary School	East Garo Hills	Deficit								345	-107.5	
26	Mendipather, Sec School	East Garo Hills	Deficit								308	-144.5	
71	St. Anthony School	East Khasi Hills	Deficit								542	89.5	
60	Laitumkhrah Presbyterian Higher Secondary School	East Khasi Hills	Deficit								535	82.5	
63	St. Gabrial's H/sec School	East Khasi Hills	Deficit								516	63.5	
74	St. John Bosco Higher Secondary School	East Khasi Hills	Deficit								514	61.5	
61	Tynring Presbyterian Higher Secondary School	East Khasi Hills	Govt Aided								511	58.5	
72	Mahatma Gandhi Secondary School	East Khasi Hills	Govt Aided								511	58.5	
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73	Maurice Patrick King Memorial Laitryngew High School	East Khasi Hills	Govt Aided								472	19.5	
68	Diengiei Sec School	East Khasi Hills	Govt Aided								470	17.5	
62	Unitarian Sec School	East Khasi Hills	Govt Aided								466	13.5	
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53	Khad ar Nor Proceeding Sec.school	Jaintia Hills	Govt Aided								451	-1.5	
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57	Biate Secondary School	Jaintia Hills	Govt Aided								186	-266.5	
52	St. Dominic Hr.Sec.School, Mawkyndung	Jaintia Hills	Deficit								170	-282.5	
48	Rymbai Govt Sec School	Jaintia Hills	N.A.								0	Not Computed	
42	Umling Sec School	Ri- bhoi	Govt.								492	39.5	
41	Kynjoin Umran Presbyterian Sec School	Ri- bhoi	Any other								482	29.5	
40	Umtasor Mawdkhar Sec School	Ri- bhoi	N.A.								466	13.5	
43	Umpathaw Presbyterian Sec School	Ri- bhoi	Govt Aided								449	-3.5	
39	Nongbah Myrdon Sec. School	Ri- bhoi	Community								370	-82.5	
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10	Betasing H/S School	West Garo Hills	Govt Aided								323	-129.5	
9	Mahendraganj Deficit Sec School	West Garo Hills	Deficit								270	-182.5	
8	Abdul Gofur Memorial Sec School	West Garo Hills	Govt Aided								236	-216.5	
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37	St. Joseph' Sec School	West Khasi Hills	Any other								463	10.5	
38	Pastorate Laitkseh Christian Sec School	West Khasi Hills	Any other								453	0.5	
29	k.J.P. Synod Sepngi H/S School	West Khasi Hills	Any other								452	-0.5	
31	Tirot Sing Memorial Sec School	West Khasi Hills	Society								452	-0.5	
32	Manai Sec School	West Khasi Hills	Any other								373	-79.5	
33	Aradonga Sec School	West Khasi Hills	Deficit								347	-105.5	
34	Mallangkona Govt. H/Sec School	West Khasi Hills	Govt.								340	-112.5	
35	Jingiati Sec School	West Khasi Hills	Govt Aided								118	-334.5	
36	Indra Gandhi Mem Sec School	West Khasi Hills	N.A.								0	Not Computed	

Legends: Above Average | Average | Below Average | Not Computed | Not Computed/Insufficient Data

Appendix 2:

Data Analysis based on indices – Area Cluster Wise

Nature of School Governance * ICT Scheme Index Crosstabulation				
	ICT Scheme Index			
	Above Average	Average	Below Average	Total
Missing		1	3	4
Any other	3	5	3	11
Community	1		1	2
Deficit	9	3	7	19
Govt Aided	9	13	7	29
Govt.	1		1	2
Missionary funded	2	2		4
Society		1		1
Total	25	25	22	72

Location-Cluster * School Receptiveness Crosstabulation					
		School Receptiveness			
		Above Average	Average	Below Average	Total
Garo Hills	Count	9	14	4	27
	% within School Receptiveness	23.7%	46.7%	57.1%	36.0%
	% of Total	12.0%	18.7%	5.3%	36.0%
Jaintia-Ri-bhoi	Count	10	8	1	19
	% within School Receptiveness	26.3%	26.7%	14.3%	25.3%
	% of Total	13.3%	10.7%	1.3%	25.3%
Khasi Hills	Count	19	8	2	29
	% within School Receptiveness	50.0%	26.7%	28.6%	38.7%
	% of Total	25.3%	10.7%	2.7%	38.7%
Total	Count	38	30	7	75
	% within School Receptiveness	100.0%	100.0%	100.0%	100.0%
	% of Total	50.7%	40.0%	9.3%	100.0%

Location-Cluster * School Learning Climate Crosstabulation					
		School Learning Climate			
		Above Average	**Average**	**Below Average**	**Total**
Garo Hills	Count	12	9	6	27
	% within School Learning Climate	26.1%	50.0%	54.5%	36.0%
	% of Total	16.0%	12.0%	8.0%	36.0%
Jaintia-Ri-Bhoi	Count	12	4	3	19
	% within School Learning Climate	26.1%	22.2%	27.3%	25.3%
	% of Total	16.0%	5.3%	4.0%	25.3%
Khasi Hills	Count	22	5	2	29
	% within School Learning Climate	47.8%	27.8%	18.2%	38.7%
	% of Total	29.3%	6.7%	2.7%	38.7%
Total	Count	46	18	11	75
	% within School Learning Climate	100.0%	100.0%	100.0%	100.0%
	% of Total	61.3%	24.0%	14.7%	100.0%

Location-Cluster * Students' Performance Other Subjects Crosstabulation					
		Students' Performance Other Subjects			
		Above Average	Average	Below Average	Total
Garo Hills	Count	4	5	18	27
	% within Students' Performance Other Subjects	36.4%	15.6%	56.3%	36.0%
	% of Total	5.3%	6.7%	24.0%	36.0%
Jaintia-Ri-Bhoi	Count	1	10	8	19
	% within Students' Performance Other Subjects	9.1%	31.3%	25.0%	25.3%
	% of Total	1.3%	13.3%	10.7%	25.3%
Khasi Hills	Count	6	17	6	29
	% within Students' Performance Other Subjects	54.5%	53.1%	18.8%	38.7%
	% of Total	8.0%	22.7%	8.0%	38.7%
Total	Count	11	32	32	75
	% within Students' Performance Other Subjects	100.0%	100.0%	100.0%	100.0%
	% of Total	14.7%	42.7%	42.7%	100.0%

Location-Cluster * Students' Performance Computers Crosstabulation					
		Students' Performance Computers			
		Above Average	Average	Below Average	Total
Garo Hills	Count	2	8	17	27
	% within Students' Performance Computers	22.2%	23.5%	53.1%	36.0%
	% of Total	2.7%	10.7%	22.7%	36.0%
Jaintia-Ri-Bhoi	Count	3	9	7	19
	% within Students' Performance Computers	33.3%	26.5%	21.9%	25.3%
	% of Total	4.0%	12.0%	9.3%	25.3%
Khasi Hills	Count	4	17	8	29
	% within Students' Performance Computers	44.4%	50.0%	25.0%	38.7%
	% of Total	5.3%	22.7%	10.7%	38.7%
Total	Count	9	34	32	75
	% within Students' Performance Computers	100.0%	100.0%	100.0%	100.0%
	% of Total	12.0%	45.3%	42.7%	100.0%

Location-Cluster * School Facilities Crosstabulation					
		School Facilities-Infrastructure			
		Above Average	Average	Below Average	Total
Garo Hills	Count	13	12	2	27
	% within School Facilities	40.6%	38.7%	16.7%	36.0%
	% of Total	17.3%	16.0%	2.7%	36.0%
Jaintia-Ri-Bhoi	Count	3	10	6	19
	% within School Facilities	9.4%	32.3%	50.0%	25.3%
	% of Total	4.0%	13.3%	8.0%	25.3%
Khasi Hills	Count	16	9	4	29
	% within School Facilities	50.0%	29.0%	33.3%	38.7%
	% of Total	21.3%	12.0%	5.3%	38.7%
Total	Count	32	31	12	75
	% within School Facilities	100.0%	100.0%	100.0%	100.0%
	% of Total	42.7%	41.3%	16.0%	100.0%

Location-Cluster * Computer Teacher Willingness Crosstabulation				
		Computer Teacher Willingness		
		Above Average	Average	Total
Garo Hills	Count	16	11	27
	% within Computer Teacher Willingness	31.4%	45.8%	36.0%
	% of Total	21.3%	14.7%	36.0%
Jaintia-Ri-Bhoi	Count	15	4	19
	% within Computer Teacher Willingness	29.4%	16.7%	25.3%
	% of Total	20.0%	5.3%	25.3%
Khasi Hills	Count	20	9	29
	% within Computer Teacher Willingness	39.2%	37.5%	38.7%
	% of Total	26.7%	12.0%	38.7%
Total	Count	51	24	75
	% within Computer Teacher Willingness	100.0%	100.0%	100.0%
	% of Total	68.0%	32.0%	100.0%

Location-Cluster * Computer Teacher Competence Crosstabulation					
		Computer Teacher Competence			
		Above Average	Average	Below Average	Total
Garo Hills	Count	5	13	9	27
	% within Computer Teacher Competence	38.5%	31.0%	45.0%	36.0%
	% of Total	6.7%	17.3%	12.0%	36.0%
Jaintia-Ri-Bhoi	Count	2	14	3	19
	% within Computer Teacher Competence	15.4%	33.3%	15.0%	25.3%
	% of Total	2.7%	18.7%	4.0%	25.3%
Khasi Hills	Count	6	15	8	29
	% within Computer Teacher Competence	46.2%	35.7%	40.0%	38.7%
	% of Total	8.0%	20.0%	10.7%	38.7%
Total	Count	13	42	20	75
	% within Computer Teacher Competence	100.0%	100.0%	100.0%	100.0%
	% of Total	17.3%	56.0%	26.7%	100.0%

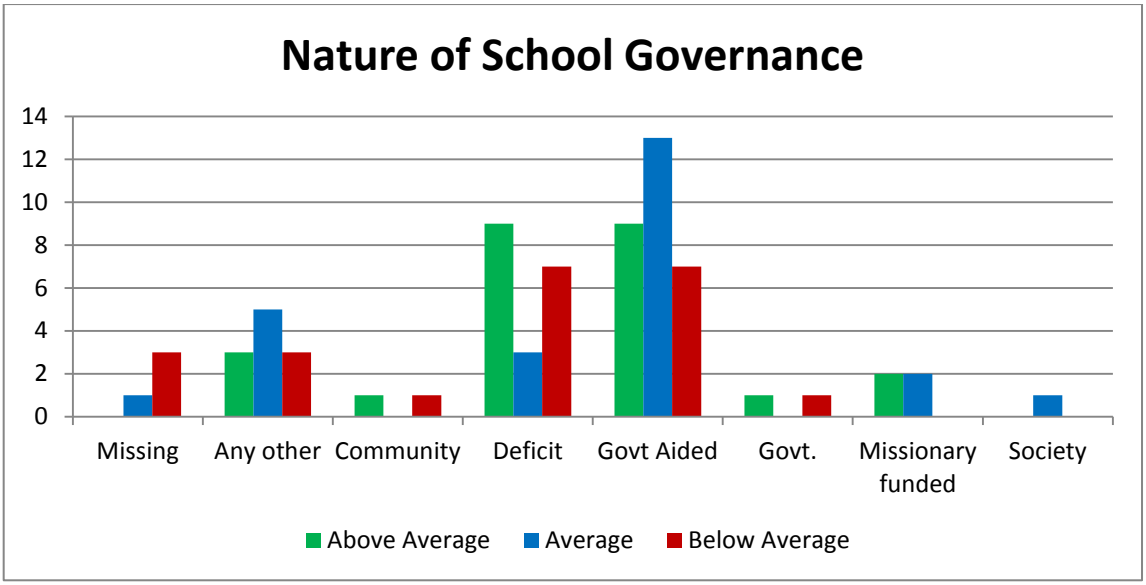
Location-Cluster * Other Teachers' Willingness Crosstabulation					
		Other Teachers' Willingness			
		Above Average	Average	Below Average	Total
Garo Hills	Count	13	8	6	27
	% within Other Teachers' Willingness	31.7%	36.4%	50.0%	36.0%
	% of Total	17.3%	10.7%	8.0%	36.0%
Jaintia-Ri-Bhoi	Count	10	6	3	19
	% within Other Teachers' Willingness	24.4%	27.3%	25.0%	25.3%
	% of Total	13.3%	8.0%	4.0%	25.3%
Khasi Hills	Count	18	8	3	29
	% within Other Teachers' Willingness	43.9%	36.4%	25.0%	38.7%
	% of Total	24.0%	10.7%	4.0%	38.7%
Total	Count	41	22	12	75
	% within Other Teachers' Willingness	100.0%	100.0%	100.0%	100.0%
	% of Total	54.7%	29.3%	16.0%	100.0%

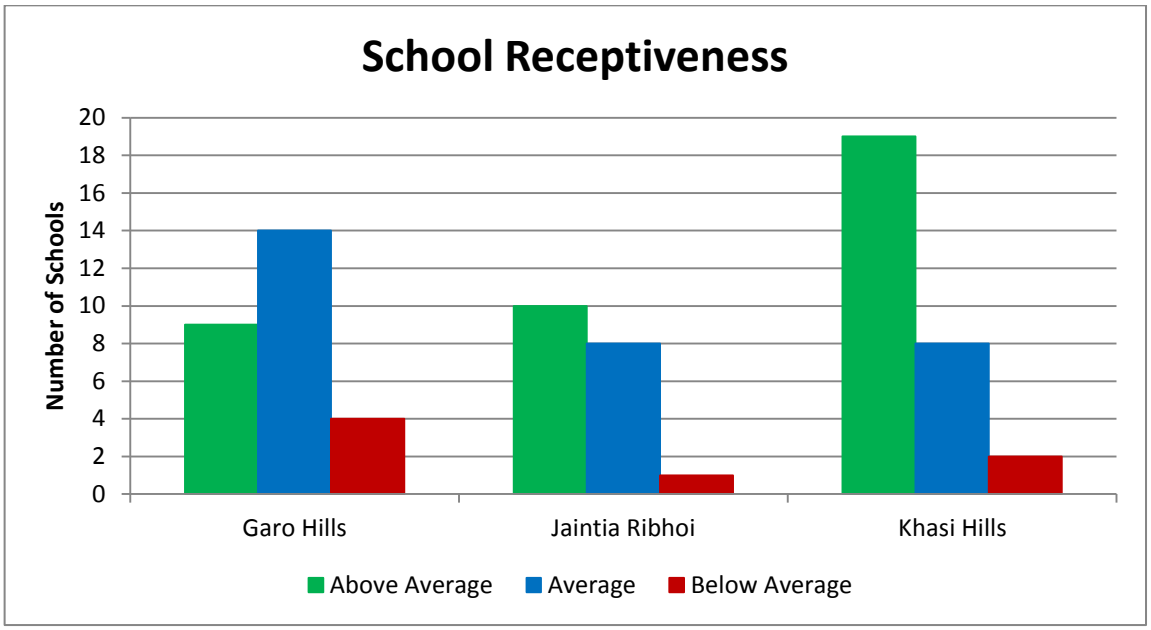
Location-Cluster * School Work Climate Crosstabulation					
		School Work Climate			
		Above Average	Average	Below Average	Total
Garo Hills	Count	13	11	3	27
	% within School Work Climate	29.5%	45.8%	42.9%	36.0%
	% of Total	17.3%	14.7%	4.0%	36.0%
Jaintia-Ri-Bhoi	Count	13	4	2	19
	% within School Work Climate	29.5%	16.7%	28.6%	25.3%
	% of Total	17.3%	5.3%	2.7%	25.3%
Khasi Hills	Count	18	9	2	29
	% within School Work Climate	40.9%	37.5%	28.6%	38.7%
	% of Total	24.0%	12.0%	2.7%	38.7%
Total	Count	44	24	7	75
	% within School Work Climate	100.0%	100.0%	100.0%	100.0%
	% of Total	58.7%	32.0%	9.3%	100.0%

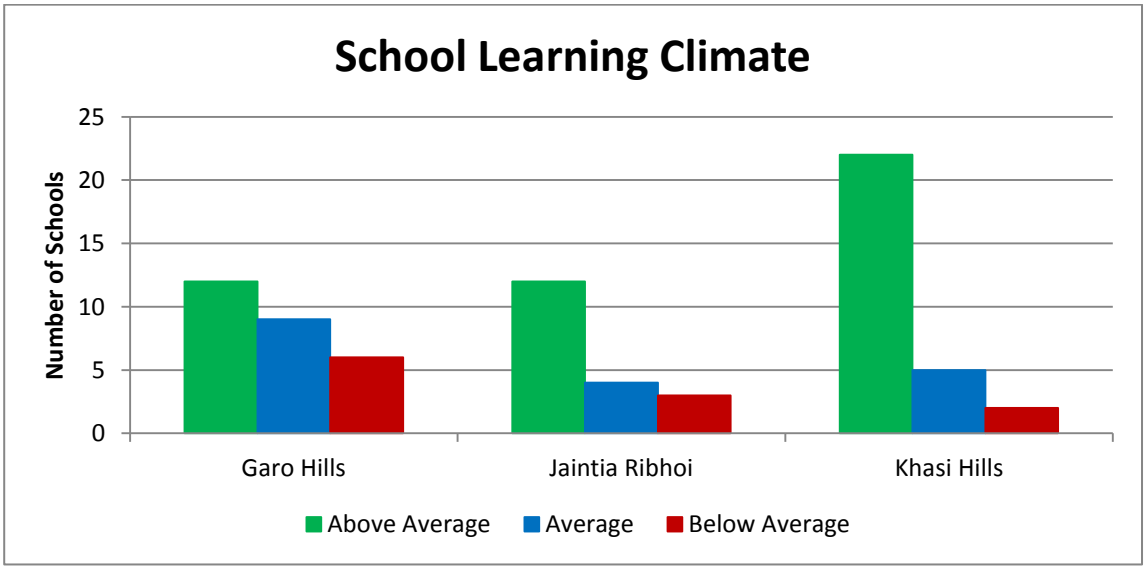
Location-Cluster * ICT Scheme Index Crosstabulation					
		ICT Scheme Index			
		Above Average	Average	Below Average	Total
Garo Hills	Count	3	10	13	26
	% within ICT Scheme Index	12.0%	40.0%	59.1%	36.1%
	% of Total	4.2%	13.9%	18.1%	36.1%
Jaintia-Ri-Bhoi	Count	8	6	4	18
	% within ICT Scheme Index	32.0%	24.0%	18.2%	25.0%
	% of Total	11.1%	8.3%	5.6%	25.0%
Khasi Hills	Count	14	9	5	28
	% within ICT Scheme Index	56.0%	36.0%	22.7%	38.9%
	% of Total	19.4%	12.5%	6.9%	38.9%
Total	Count	25	25	22	72
	% within ICT Scheme Index	100.0%	100.0%	100.0%	100.0%
	% of Total	34.7%	34.7%	30.6%	100.0%

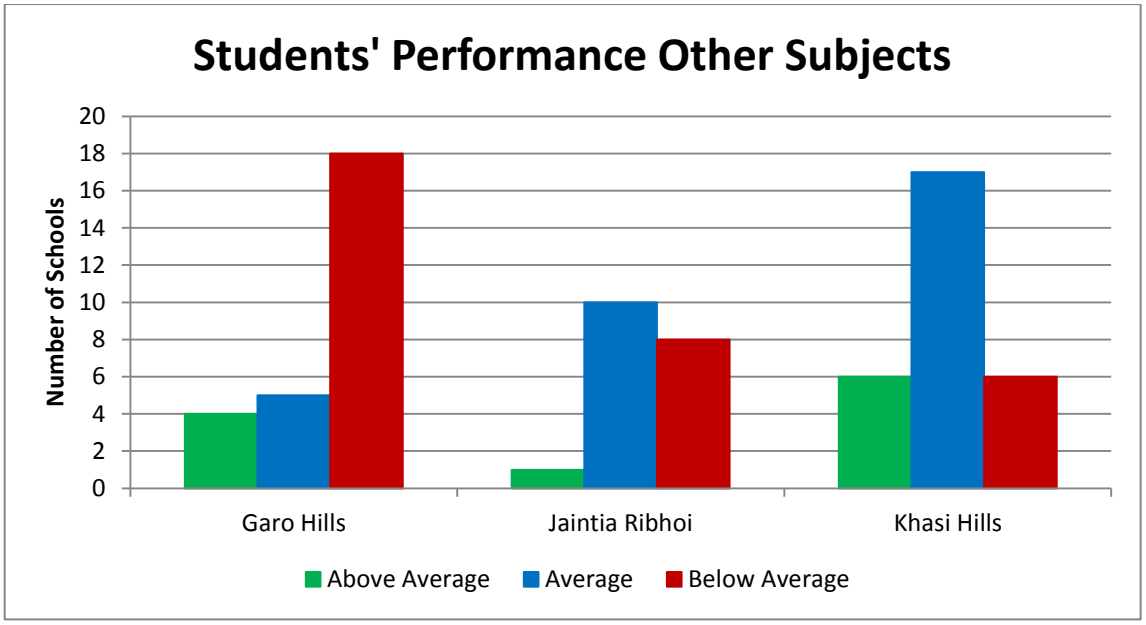
Appendix 3:

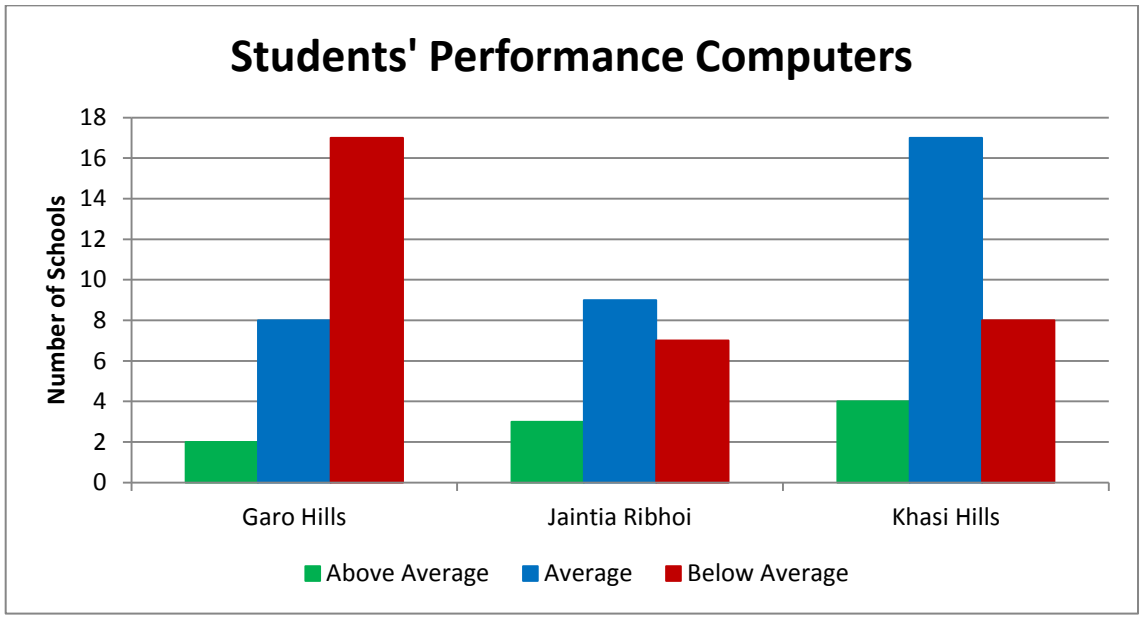
Plots based on indices – Area Cluster Wise

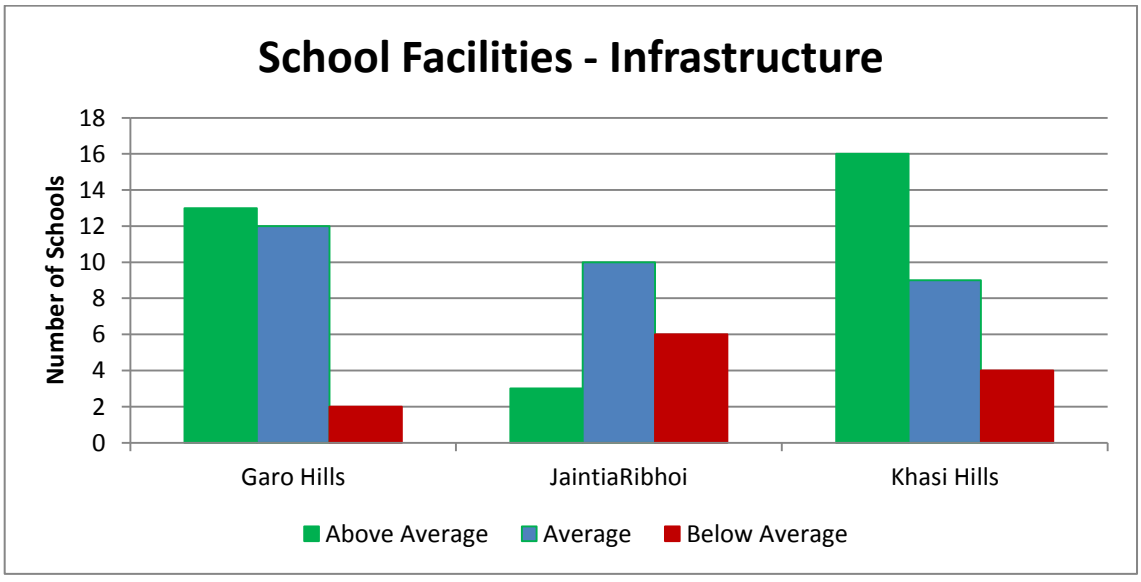

Nature of School Governance
14
12
10
8
6
4
2
0
Missing
Any other
Community
Deficit
Govt Aided
Govt.
Missionary funded
Society
Above Average
Average
Below Average

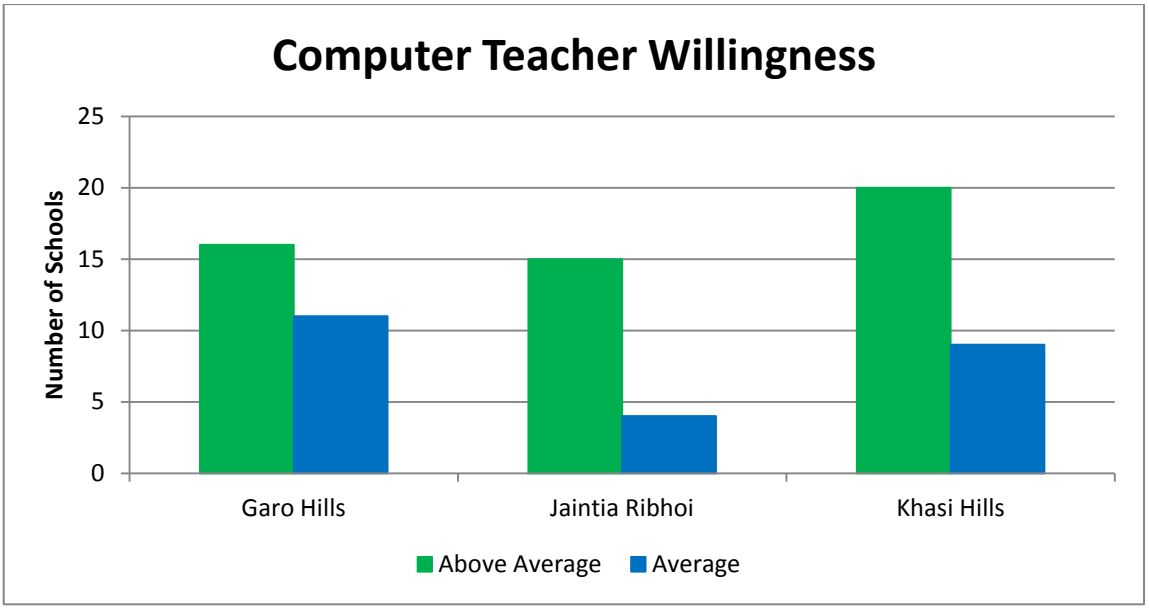

School Receptiveness
Number of Schools
20
18
16
14
12
10
8
6
4
2
0
Garo Hills
Jaintia Ribhoi
Khasi Hills
Above Average
Average
Below Average

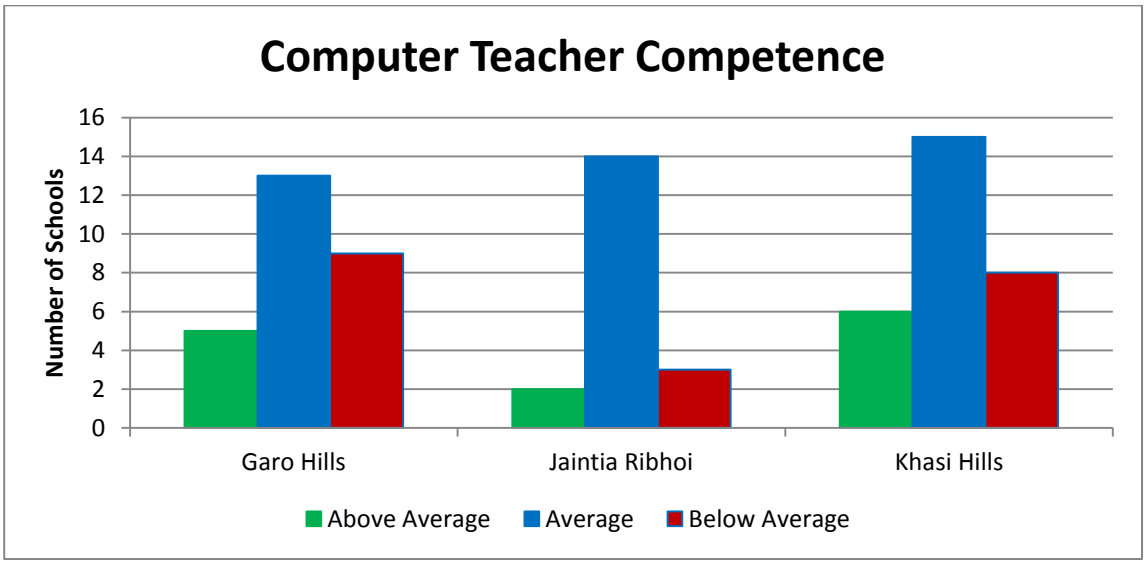

School Learning Climate
Number of Schools
25
20
15
10
5
0
Garo Hills
Jaintia Ribhoi
Khasi Hills
Above Average
Average
Below Average

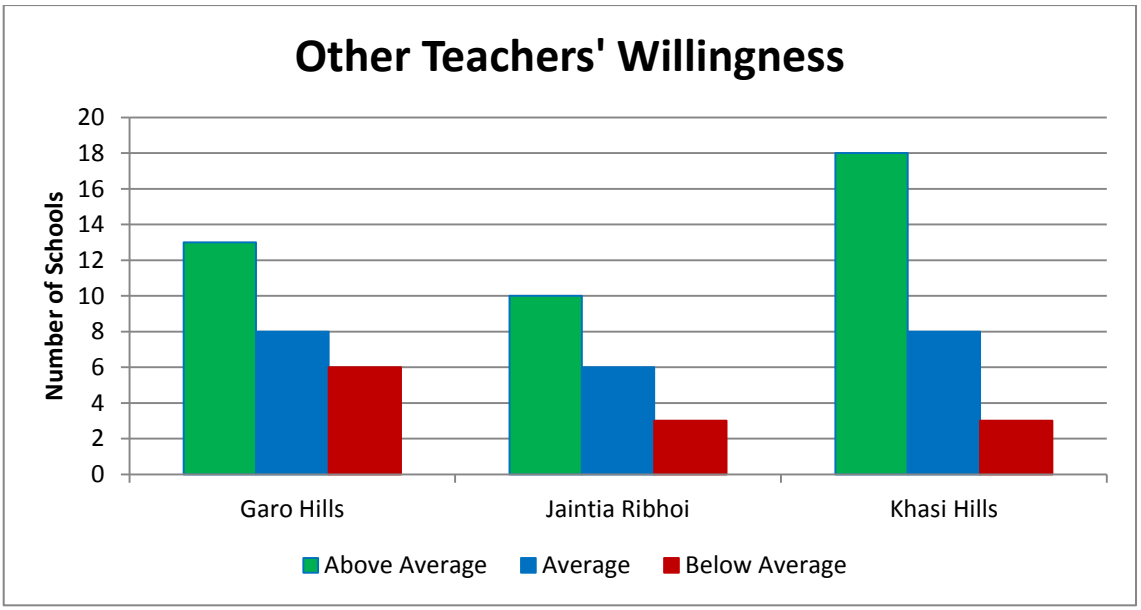

Students' Performance Other Subjects
Number of Schools
20
18
16
14
12
10
8
6
4
2
0
Garo Hills
Jaintia Ribhoi
Khasi Hills
Above Average
Average
Below Average

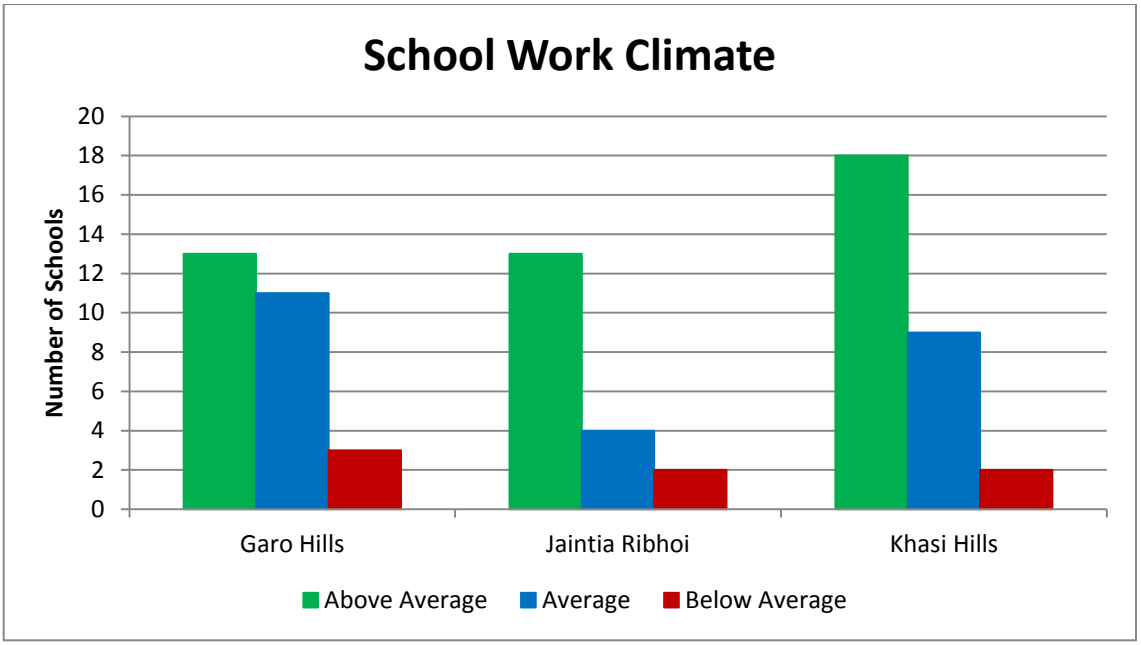

Students' Performance Computers
Number of Schools
18
16
14
12
10
8
6
4
2
0
Garo Hills
Jaintia Ribhoi
Khasi Hills
Above Average
Average
Below Average

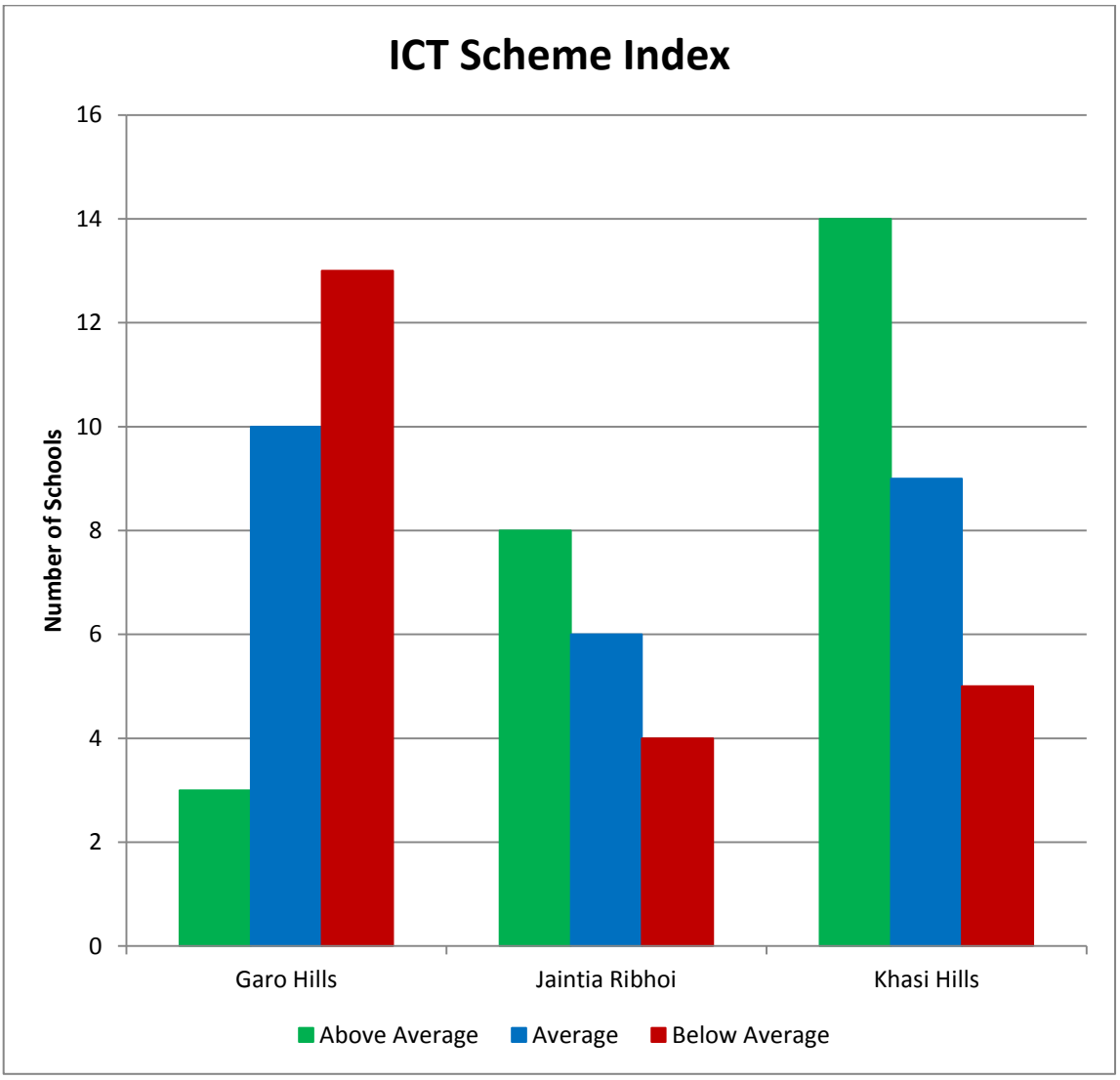

School Facilities - Infrastructure
Number of Schools
18
16
14
12
10
8
6
4
2
0
Garo Hills
JaintiaRibhoi
Khasi Hills
Above Average
Average
Below Average


Computer Teacher Willingness
Number of Schools
25
20
15
10
5
0
Garo Hills
Jaintia Ribhoi
Khasi Hills
Above Average
Average


Computer Teacher Competence
Number of Schools
16
14
12
10
8
6
4
2
0
Garo Hills
Jaintia Ribhoi
Khasi Hills
Above Average
Average
Below Average


Other Teachers' Willingness
Number of Schools
20
18
16
14
12
10
8
6
4
2
0
Garo Hills
Jaintia Ribhoi
Khasi Hills
Above Average
Average
Below Average


School Work Climate
Number of Schools
20
18
16
14
12
10
8
6
4
2
0
Garo Hills
Jaintia Ribhoi
Khasi Hills
Above Average
Average
Below Average


ICT Scheme Index
Number of Schools
16
14
12
10
8
6
4
2
0
Garo Hills
Jaintia Ribhoi
Khasi Hills
Above Average
Average
Below Average

Appendix 4:

Data Analysis based on indices – District Wise

District * Nature of School Governance Crosstabulation									
		School Governance							
District		Any other	Community	Deficit	Govt Aided	Govt.	Missionary funded	Society	Total
East Garo Hills	Count			2	4				6
	% within Schl_nature	.0%	.0%	10.5%	13.8%	.0%	.0%	.0%	8.0%
	% of Total	.0%	.0%	2.7%	5.3%	.0%	.0%	.0%	8.0%
East Khasi Hills	Count	1		6	9		1		17
	% within Schl_nature	9.1%	.0%	31.6%	31.0%	.0%	25.0%	.0%	24.0%
	% of Total	1.3%	.0%	8.0%	12.0%	.0%	1.3%	.0%	24.0%
Jaintia Hills	Count	2	1	4	4		1		12
	% within Schl_nature	18.2%	50.0%	21.1%	13.8%	.0%	25.0%	.0%	17.3%
	% of Total	2.7%	1.3%	5.3%	5.3%	.0%	1.3%	.0%	17.3%
Ri- Bhoi	Count	2	1		1	1			5
	% within Schl_nature	18.2%	50.0%	.0%	3.4%	50.0%	.0%	.0%	8.0%
	% of Total	2.7%	1.3%	.0%	1.3%	1.3%	.0%	.0%	8.0%
South Garo Hills	Count	1		1	2				4
	% within Schl_nature	9.1%	.0%	5.3%	6.9%	.0%	.0%	.0%	5.3%
	% of Total	1.3%	.0%	1.3%	2.7%	.0%	.0%	.0%	5.3%
West Garo Hills	Count	1		5	7		1		14
	% within Schl_nature	9.1%	.0%	26.3%	24.1%	.0%	25.0%	.0%	22.7%
	% of Total	1.3%	.0%	6.7%	9.3%	.0%	1.3%	.0%	22.7%
West Khasi Hills	Count	4		1	2	1	1	1	10
	% within Schl_nature	36.4%	.0%	5.3%	6.9%	50.0%	25.0%	100.0%	14.7%
	% of Total	5.3%	.0%	1.3%	2.7%	1.3%	1.3%	1.3%	14.7%
Total	Count	11	2	19	29	2	4	1	68
	% within Schl_nature	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	14.7%	2.7%	25.3%	38.7%	2.7%	5.3%	1.3%	100.0%

District * School Receptiveness Crosstabulation

		School Receptiveness			
		Above Average	Average	Below Average	Total
East Garo Hills	Count	2	3	1	6
	% within School Receptiveness	5.3%	10.0%	14.3%	8.0%
	% of Total	2.7%	4.0%	1.3%	8.0%
East Khasi Hills	Count	13	4	1	18
	% within School Receptiveness	34.2%	13.3%	14.3%	24.0%
	% of Total	17.3%	5.3%	1.3%	24.0%
Jaintia Hills	Count	8	4	1	13
	% within School Receptiveness	21.1%	13.3%	14.3%	17.3%
	% of Total	10.7%	5.3%	1.3%	17.3%
Ri- Bhoi	Count	2	4		6
	% within School Receptiveness	5.3%	13.3%	.0%	8.0%
	% of Total	2.7%	5.3%	.0%	8.0%
South Garo Hills	Count	3	1		4
	% within School Receptiveness	7.9%	3.3%	.0%	5.3%
	% of Total	4.0%	1.3%	.0%	5.3%
West Garo Hills	Count	4	10	3	17
	% within School Receptiveness	10.5%	33.3%	42.9%	22.7%
	% of Total	5.3%	13.3%	4.0%	22.7%
West Khasi Hills	Count	6	4	1	11
	% within School Receptiveness	15.8%	13.3%	14.3%	14.7%
	% of Total	8.0%	5.3%	1.3%	14.7%
Total	Count	38	30	7	75
	% within School Receptiveness	100.0%	100.0%	100.0%	100.0%
	% of Total	50.7%	40.0%	9.3%	100.0%

District * School Learning Climate Crosstabulation					
		School Learning Climate			
		Above Average	Average	Below Average	Total
East Garo Hills	Count	4	2		6
	% within School Learning Climate	8.7%	11.1%	.0%	8.0%
	% of Total	5.3%	2.7%	.0%	8.0%
East Khasi Hills	Count	16	2		18
	% within School Learning Climate	34.8%	11.1%	.0%	24.0%
	% of Total	21.3%	2.7%	.0%	24.0%
Jaintia Hills	Count	8	2	3	13
	% within School Learning Climate	17.4%	11.1%	27.3%	17.3%
	% of Total	10.7%	2.7%	4.0%	17.3%
Ri- Bhoi	Count	4	2		6
	% within School Learning Climate	8.7%	11.1%	.0%	8.0%
	% of Total	5.3%	2.7%	.0%	8.0%
South Garo Hills	Count	2	2		4
	% within School Learning Climate	4.3%	11.1%	.0%	5.3%
	% of Total	2.7%	2.7%	.0%	5.3%
West Garo Hills	Count	6	5	6	17
	% within School Learning Climate	13.0%	27.8%	54.5%	22.7%
	% of Total	8.0%	6.7%	8.0%	22.7%
West Khasi Hills	Count	6	3	2	11
	% within School Learning Climate	13.0%	16.7%	18.2%	14.7%
	% of Total	8.0%	4.0%	2.7%	14.7%
Total	Count	46	18	11	75
	% within School Learning Climate	100.0%	100.0%	100.0%	100.0%
	% of Total	61.3%	24.0%	14.7%	100.0%

District * Students' Performance Other Subjects Crosstabulation					
		Students' Performance Other Subjects			
		Above Average	Average	Below Average	Total
East Garo Hills	Count	2	2	2	6
	% within Students' Performance Other Subjects	18.2%	6.3%	6.3%	8.0%
	% of Total	2.7%	2.7%	2.7%	8.0%
East Khasi Hills	Count	6	12		18
	% within Students' Performance Other Subjects	54.5%	37.5%	.0%	24.0%
	% of Total	8.0%	16.0%	.0%	24.0%
Jaintia Hills	Count	1	5	7	13
	% within Students' Performance Other Subjects	9.1%	15.6%	21.9%	17.3%
	% of Total	1.3%	6.7%	9.3%	17.3%
Ri- Bhoi	Count		5	1	6
	% within Students' Performance Other Subjects	.0%	15.6%	3.1%	8.0%
	% of Total	.0%	6.7%	1.3%	8.0%
South Garo Hills	Count		2	2	4
	% within Students' Performance Other Subjects	.0%	6.3%	6.3%	5.3%
	% of Total	.0%	2.7%	2.7%	5.3%
West Garo Hills	Count	2	1	14	17
	% within Students' Performance Other Subjects	18.2%	3.1%	43.8%	22.7%
	% of Total	2.7%	1.3%	18.7%	22.7%
West Khasi Hills	Count		5	6	11
	% within Students' Performance Other Subjects	.0%	15.6%	18.8%	14.7%
	% of Total	.0%	6.7%	8.0%	14.7%
Total	Count	11	32	32	75
	% within Students' Performance Other Subjects	100.0%	100.0%	100.0%	100.0%
	% of Total	14.7%	42.7%	42.7%	100.0%

District * Students' Performance Computers Crosstabulation					
		Students' Performance Computers			
		Above Average	Average	Below Average	Total
East Garo Hills	Count	1	2	3	6
	% within Students' Performance Computers	11.1%	5.9%	9.4%	8.0%
	% of Total	1.3%	2.7%	4.0%	8.0%
East Khasi Hills	Count	4	12	2	18
	% within Students' Performance Computers	44.4%	35.3%	6.3%	24.0%
	% of Total	5.3%	16.0%	2.7%	24.0%
Jaintia Hills	Count	3	5	5	13
	% within Students' Performance Computers	33.3%	14.7%	15.6%	17.3%
	% of Total	4.0%	6.7%	6.7%	17.3%
Ri- Bhoi	Count		4	2	6
	% within Students' Performance Computers	.0%	11.8%	6.3%	8.0%
	% of Total	.0%	5.3%	2.7%	8.0%
South Garo Hills	Count		2	2	4
	% within Students' Performance Computers	.0%	5.9%	6.3%	5.3%
	% of Total	.0%	2.7%	2.7%	5.3%
West Garo Hills	Count	1	4	12	17
	% within Students' Performance Computers	11.1%	11.8%	37.5%	22.7%
	% of Total	1.3%	5.3%	16.0%	22.7%
West Khasi Hills	Count		5	6	11
	% within Students' Performance Computers	.0%	14.7%	18.8%	14.7%
	% of Total	.0%	6.7%	8.0%	14.7%
Total	Count	9	34	32	75
	% within Students' Performance Computers	100.0%	100.0%	100.0%	100.0%
	% of Total	12.0%	45.3%	42.7%	100.0%

District * School Facilities-Infrastructure Crosstabulation					
		School Facilities-Infrastructure			
		Above Average	Average	Below Average	Total
East Garo Hills	Count	5	1		6
	% within School Facilities-Infrastructure	15.6%	3.2%	.0%	8.0%
	% of Total	6.7%	1.3%	.0%	8.0%
East Khasi Hills	Count	12	4	2	18
	% within School Facilities-Infrastructure	37.5%	12.9%	16.7%	24.0%
	% of Total	16.0%	5.3%	2.7%	24.0%
Jaintia Hills	Count	3	6	4	13
	% within School Facilities-Infrastructure	9.4%	19.4%	33.3%	17.3%
	% of Total	4.0%	8.0%	5.3%	17.3%
Ri- Bhoi	Count		4	2	6
	% within School Facilities-Infrastructure	.0%	12.9%	16.7%	8.0%
	% of Total	.0%	5.3%	2.7%	8.0%
South Garo Hills	Count	2	2		4
	% within School Facilities-Infrastructure	6.3%	6.5%	.0%	5.3%
	% of Total	2.7%	2.7%	.0%	5.3%
West Garo Hills	Count	6	9	2	17
	% within School Facilities-Infrastructure	18.8%	29.0%	16.7%	22.7%
	% of Total	8.0%	12.0%	2.7%	22.7%
West Khasi Hills	Count	4	5	2	11
	% within School Facilities-Infrastructure	12.5%	16.1%	16.7%	14.7%
	% of Total	5.3%	6.7%	2.7%	14.7%
Total	Count	32	31	12	75
	% within School Facilities-Infrastructure	100.0%	100.0%	100.0%	100.0%
	% of Total	42.7%	41.3%	16.0%	100.0%

District * Computer Teacher Willingness Crosstabulation				
		Computer Teacher Willingness		
		Above Average	Average	Total
East Garo Hills	Count	3	3	6
	% within Computer Teacher Willingness	5.9%	12.5%	8.0%
	% of Total	4.0%	4.0%	8.0%
East Khasi Hills	Count	14	4	18
	% within Computer Teacher Willingness	27.5%	16.7%	24.0%
	% of Total	18.7%	5.3%	24.0%
Jaintia Hills	Count	11	2	13
	% within Computer Teacher Willingness	21.6%	8.3%	17.3%
	% of Total	14.7%	2.7%	17.3%
Ri- Bhoi	Count	4	2	6
	% within Computer Teacher Willingness	7.8%	8.3%	8.0%
	% of Total	5.3%	2.7%	8.0%
South Garo Hills	Count	1	3	4
	% within Computer Teacher Willingness	2.0%	12.5%	5.3%
	% of Total	1.3%	4.0%	5.3%
West Garo Hills	Count	12	5	17
	% within Computer Teacher Willingness	23.5%	20.8%	22.7%
	% of Total	16.0%	6.7%	22.7%
West Khasi Hills	Count	6	5	11
	% within Computer Teacher Willingness	11.8%	20.8%	14.7%
	% of Total	8.0%	6.7%	14.7%
Total	Count	51	24	75
	% within Computer Teacher Willingness	100.0%	100.0%	100.0%
	% of Total	68.0%	32.0%	100.0%

District * Computer Teacher Competence Crosstabulation					
		Computer Teacher Competence			
		Above Average	Average	Below Average	Total
East Garo Hills	Count	3		3	6
	% within Computer Teacher Competence	23.1%	.0%	15.0%	8.0%
	% of Total	4.0%	.0%	4.0%	8.0%
East Khasi Hills	Count	5	10	3	18
	% within Computer Teacher Competence	38.5%	23.8%	15.0%	24.0%
	% of Total	6.7%	13.3%	4.0%	24.0%
Jaintia Hills	Count	2	9	2	13
	% within Computer Teacher Competence	15.4%	21.4%	10.0%	17.3%
	% of Total	2.7%	12.0%	2.7%	17.3%
Ri- Bhoi	Count		5	1	6
	% within Computer Teacher Competence	.0%	11.9%	5.0%	8.0%
	% of Total	.0%	6.7%	1.3%	8.0%
South Garo Hills	Count		1	3	4
	% within Computer Teacher Competence	.0%	2.4%	15.0%	5.3%
	% of Total	.0%	1.3%	4.0%	5.3%
West Garo Hills	Count	2	12	3	17
	% within Computer Teacher Competence	15.4%	28.6%	15.0%	22.7%
	% of Total	2.7%	16.0%	4.0%	22.7%
West Khasi Hills	Count	1	5	5	11
	% within Computer Teacher Competence	7.7%	11.9%	25.0%	14.7%
	% of Total	1.3%	6.7%	6.7%	14.7%
Total	Count	13	42	20	75
	% within Computer Teacher Competence	100.0%	100.0%	100.0%	100.0%
	% of Total	17.3%	56.0%	26.7%	100.0%

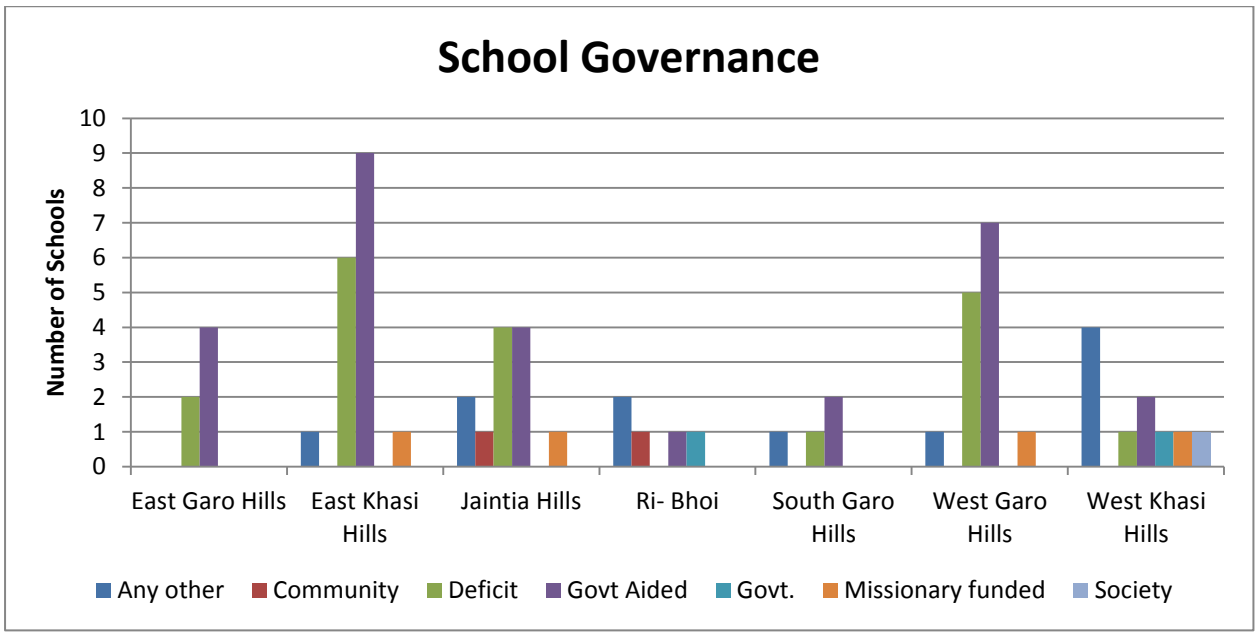
District * Other Teachers' Willingness Crosstabulation					
		Other Teachers' Willingness			
		Above Average	Average	Below Average	Total
East Garo Hills	Count	1	5		6
	% within Other Teachers' Willingness	2.4%	22.7%	.0%	8.0%
	% of Total	1.3%	6.7%	.0%	8.0%
East Khasi Hills	Count	11	7		18
	% within Other Teachers' Willingness	26.8%	31.8%	.0%	24.0%
	% of Total	14.7%	9.3%	.0%	24.0%
Jaintia Hills	Count	7	3	3	13
	% within Other Teachers' Willingness	17.1%	13.6%	25.0%	17.3%
	% of Total	9.3%	4.0%	4.0%	17.3%
Ri- Bhoi	Count	3	3		6
	% within Other Teachers' Willingness	7.3%	13.6%	.0%	8.0%
	% of Total	4.0%	4.0%	.0%	8.0%
South Garo Hills	Count	3	1		4
	% within Other Teachers' Willingness	7.3%	4.5%	.0%	5.3%
	% of Total	4.0%	1.3%	.0%	5.3%
West Garo Hills	Count	9	2	6	17
	% within Other Teachers' Willingness	22.0%	9.1%	50.0%	22.7%
	% of Total	12.0%	2.7%	8.0%	22.7%
West Khasi Hills	Count	7	1	3	11
	% within Other Teachers' Willingness	17.1%	4.5%	25.0%	14.7%
	% of Total	9.3%	1.3%	4.0%	14.7%
Total	Count	41	22	12	75
	% within Other Teachers' Willingness	100.0%	100.0%	100.0%	100.0%
	% of Total	54.7%	29.3%	16.0%	100.0%

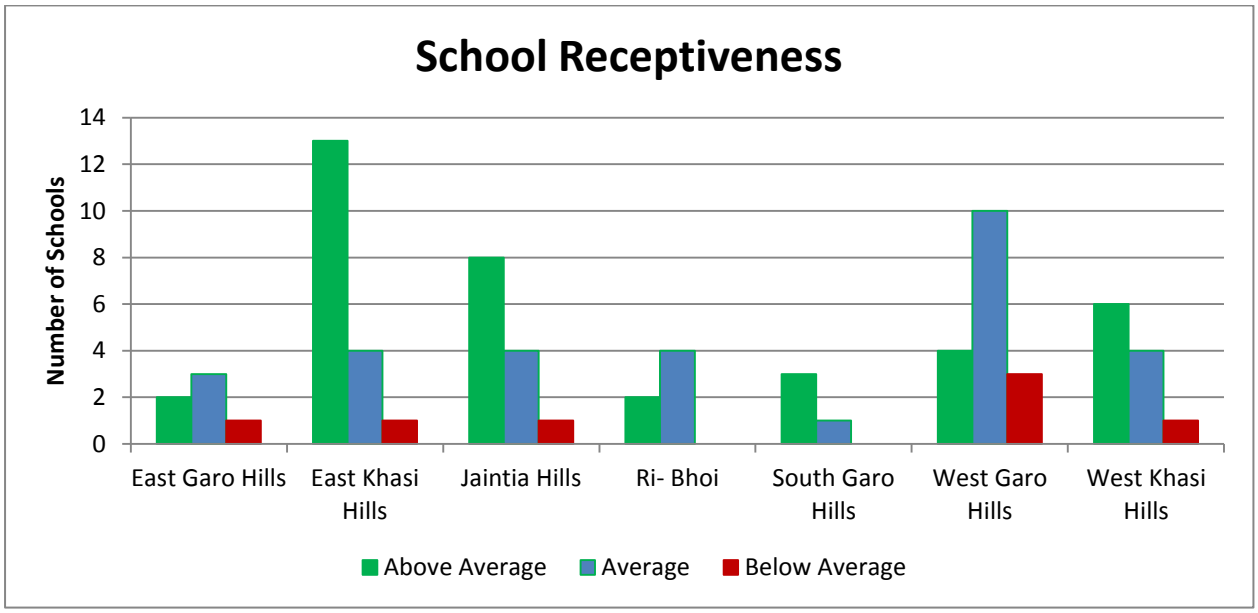
District * School Work Climate Crosstabulation					
		School Work Climate			
		Above Average	Average	Below Average	Total
East Garo Hills	Count	3	3		6
	% within School Work Climate	6.8%	12.5%	.0%	8.0%
	% of Total	4.0%	4.0%	.0%	8.0%
East Khasi Hills	Count	14	4		18
	% within School Work Climate	31.8%	16.7%	.0%	24.0%
	% of Total	18.7%	5.3%	.0%	24.0%
Jaintia Hills	Count	9	2	2	13
	% within School Work Climate	20.5%	8.3%	28.6%	17.3%
	% of Total	12.0%	2.7%	2.7%	17.3%
Ri- Bhoi	Count	4	2		6
	% within School Work Climate	9.1%	8.3%	.0%	8.0%
	% of Total	5.3%	2.7%	.0%	8.0%
South Garo Hills	Count	1	3		4
	% within School Work Climate	2.3%	12.5%	.0%	5.3%
	% of Total	1.3%	4.0%	.0%	5.3%
West Garo Hills	Count	9	5	3	17
	% within School Work Climate	20.5%	20.8%	42.9%	22.7%
	% of Total	12.0%	6.7%	4.0%	22.7%
West Khasi Hills	Count	4	5	2	11
	% within School Work Climate	9.1%	20.8%	28.6%	14.7%
	% of Total	5.3%	6.7%	2.7%	14.7%
Total	Count	44	24	7	75
	% within School Work Climate	100.0%	100.0%	100.0%	100.0%
	% of Total	58.7%	32.0%	9.3%	100.0%

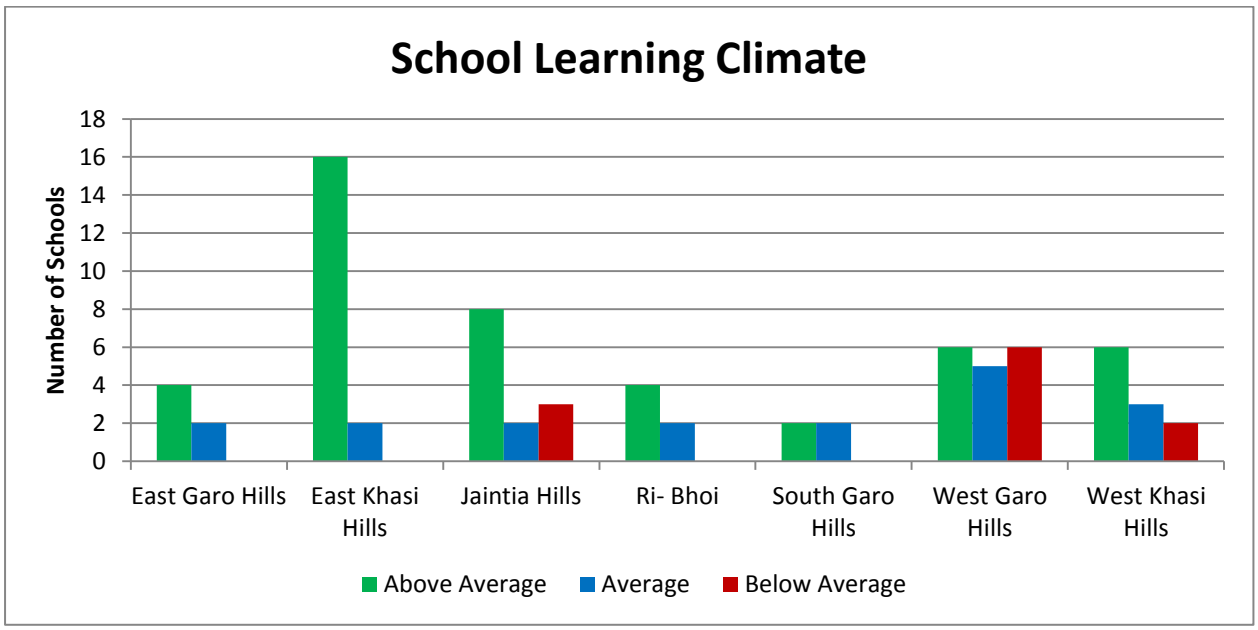
District * ICT Scheme Index Crosstabulation					
		ICT Scheme Index			
		Above Average	Average	Below Average	Total
East Garo Hills	Count	2	1	3	6
	% within ICT Scheme Index	8.0%	4.0%	13.6%	8.3%
	% of Total	2.8%	1.4%	4.2%	8.3%
East Khasi Hills	Count	12	5	1	18
	% within ICT Scheme Index	48.0%	20.0%	4.5%	25.0%
	% of Total	16.7%	6.9%	1.4%	25.0%
Jaintia Hills	Count	6	4	2	12
	% within ICT Scheme Index	24.0%	16.0%	9.1%	16.7%
	% of Total	8.3%	5.6%	2.8%	16.7%
Ri- Bhoi	Count	2	2	2	6
	% within ICT Scheme Index	8.0%	8.0%	9.1%	8.3%
	% of Total	2.8%	2.8%	2.8%	8.3%
South Garo Hills	Count		2	2	4
	% within ICT Scheme Index	.0%	8.0%	9.1%	5.6%
	% of Total	.0%	2.8%	2.8%	5.6%
West Garo Hills	Count	1	7	8	16
	% within ICT Scheme Index	4.0%	28.0%	36.4%	22.2%
	% of Total	1.4%	9.7%	11.1%	22.2%
West Khasi Hills	Count	2	4	4	10
	% within ICT Scheme Index	8.0%	16.0%	18.2%	13.9%
	% of Total	2.8%	5.6%	5.6%	13.9%
Total	Count	25	25	22	72
	% within ICT Scheme Index	100.0%	100.0%	100.0%	100.0%
	% of Total	34.7%	34.7%	30.6%	100.0%

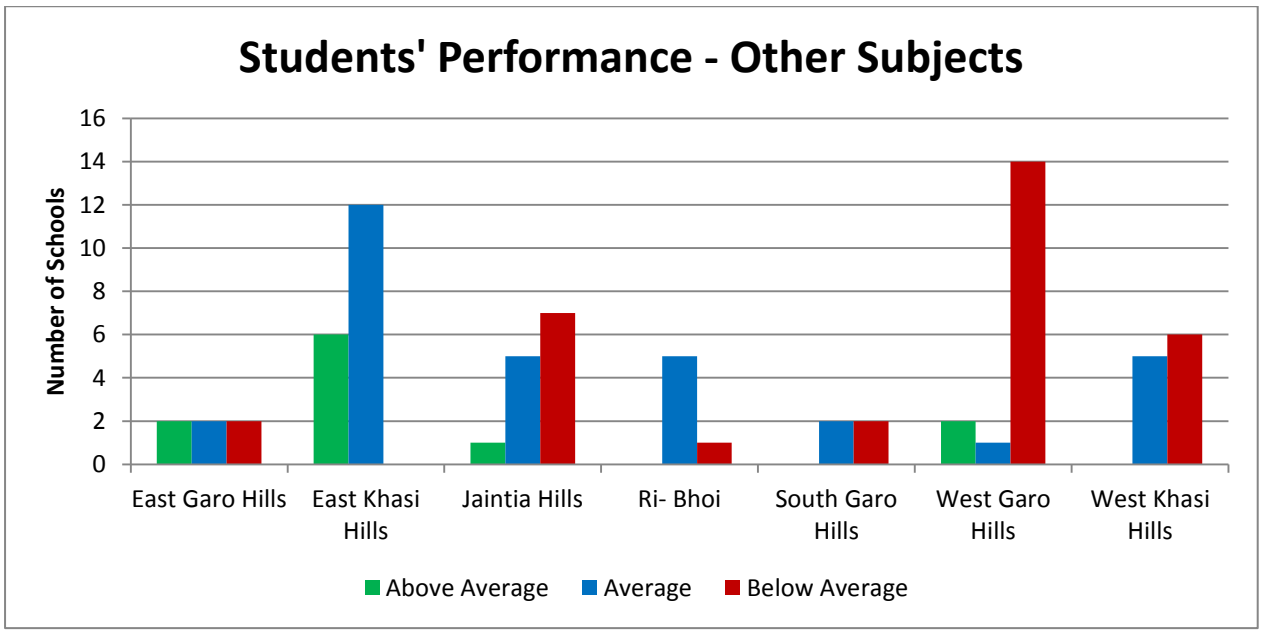
Appendix 5:

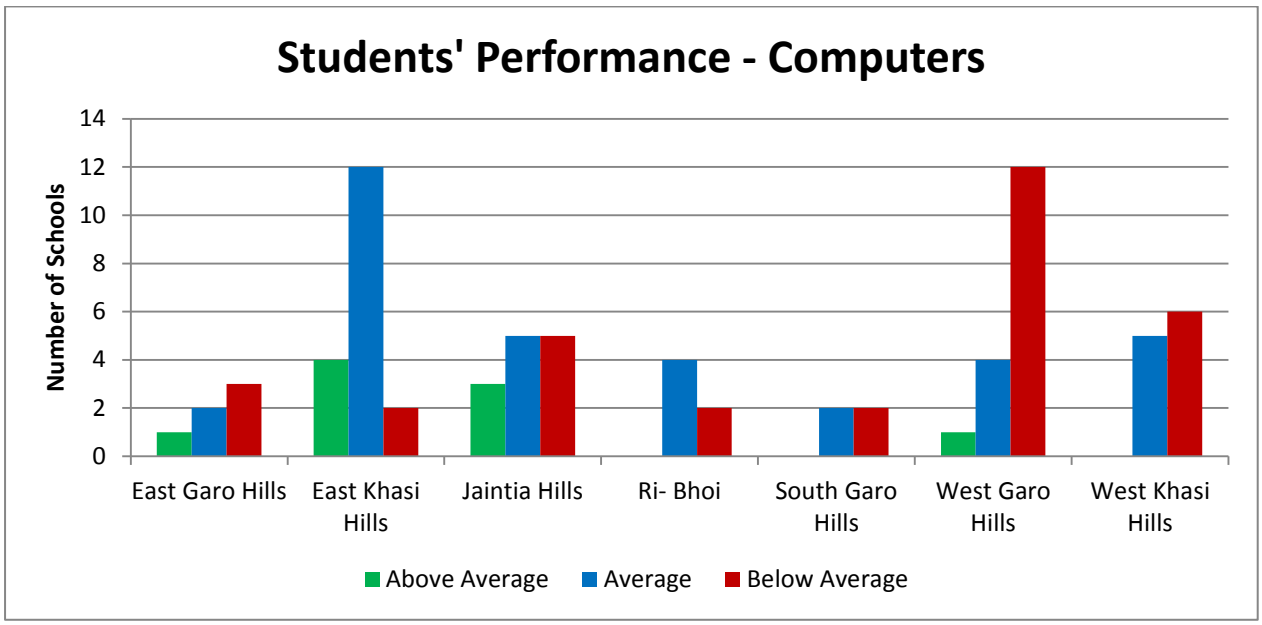
Plots based on indices – District Wise

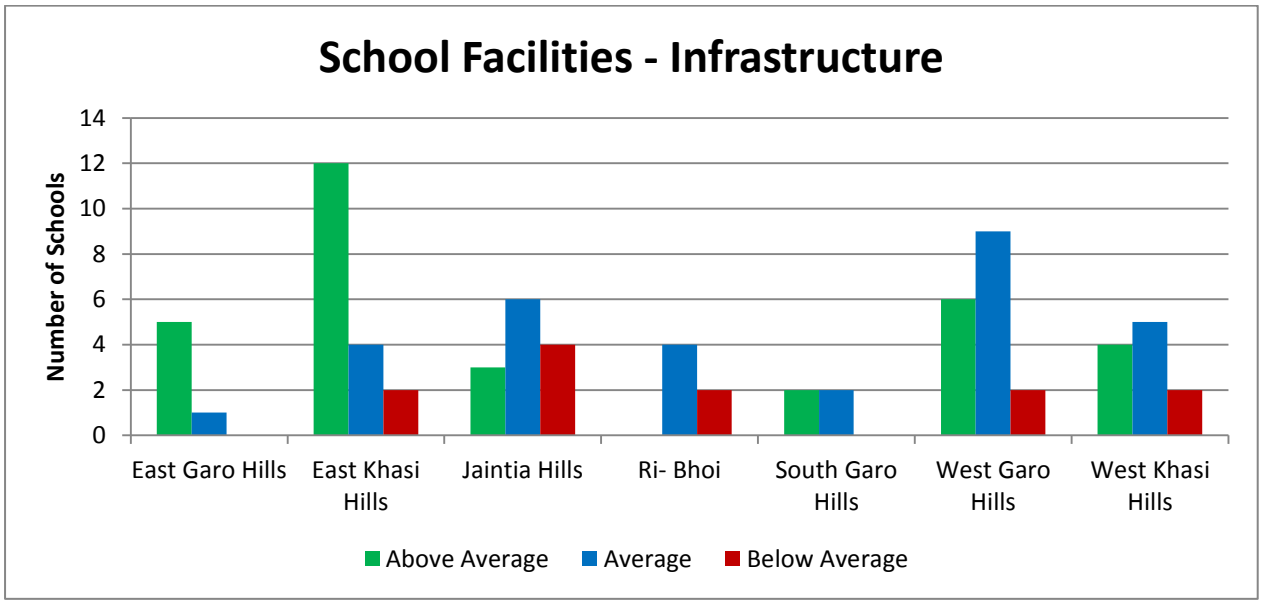

School Governance
Number of Schools
0
1
2
3
4
5
6
7
8
9
10
East Garo Hills
East Khasi Hills
Jaintia Hills
Ri- Bhoi
South Garo Hills
West Garo Hills
West Khasi Hills
Any other
Community
Deficit
Govt Aided
Govt.
Missionary funded
Society

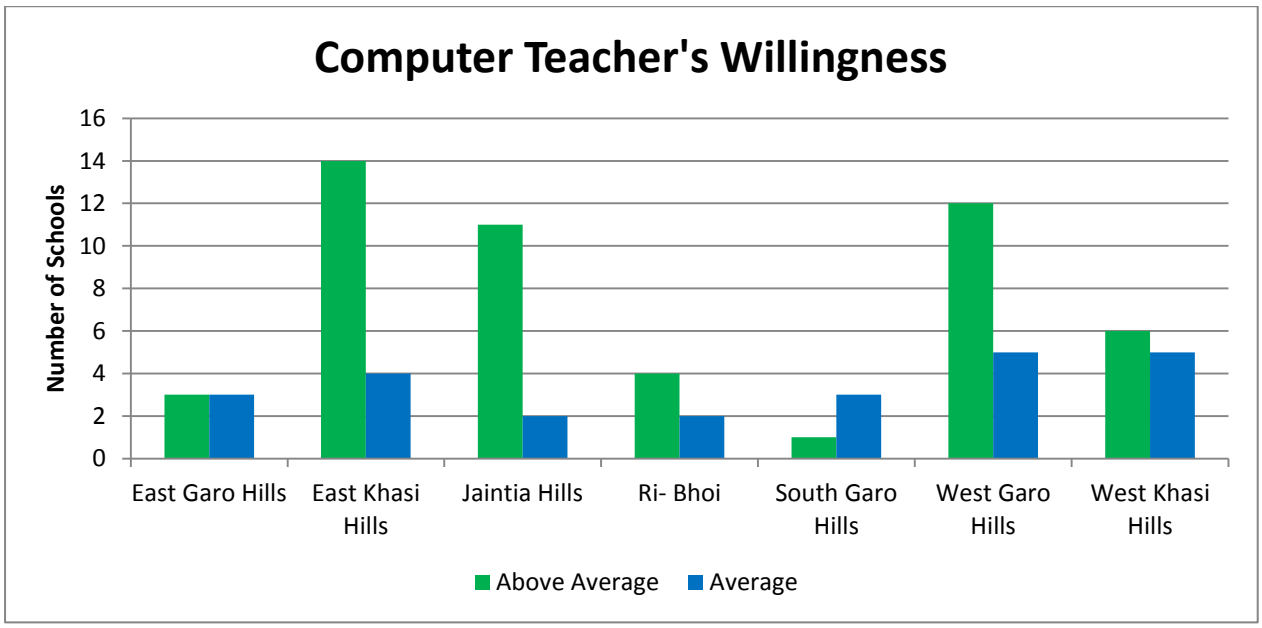

School Receptiveness
Number of Schools
0
2
4
6
8
10
12
14
East Garo Hills
East Khasi Hills
Jaintia Hills
Ri- Bhoi
South Garo Hills
West Garo Hills
West Khasi Hills
Above Average
Average
Below Average

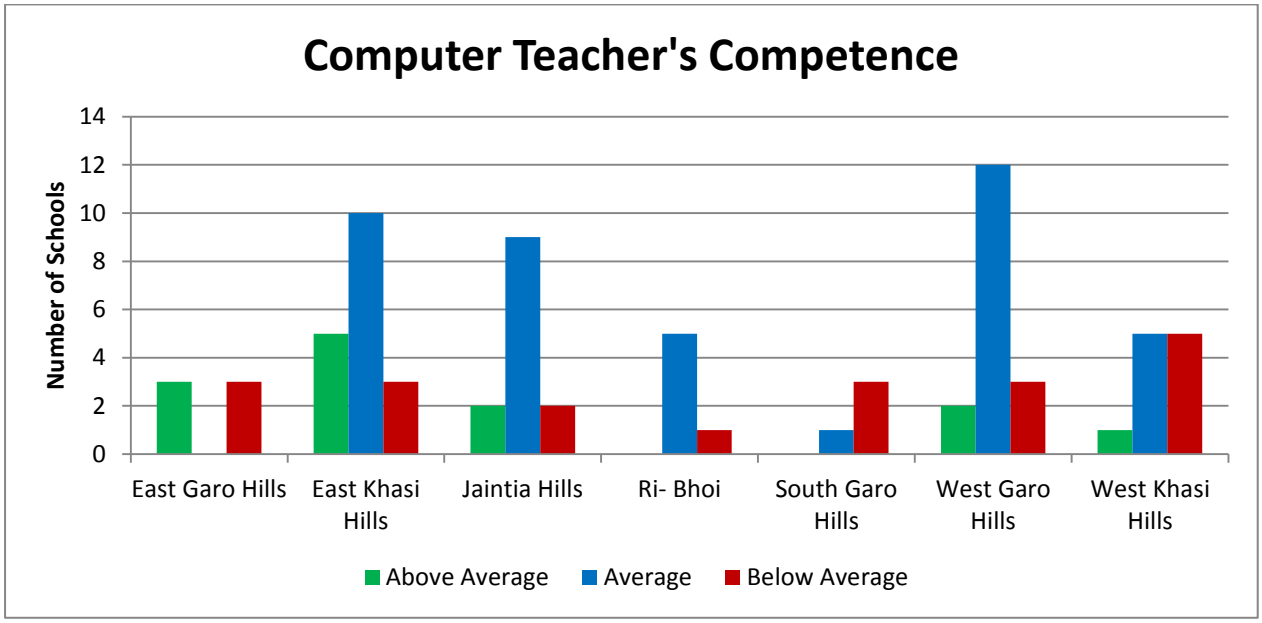

School Learning Climate
Number of Schools
0
2
4
6
8
10
12
14
16
18
East Garo Hills
East Khasi Hills
Jaintia Hills
Ri- Bhoi
South Garo Hills
West Garo Hills
West Khasi Hills
Above Average
Average
Below Average

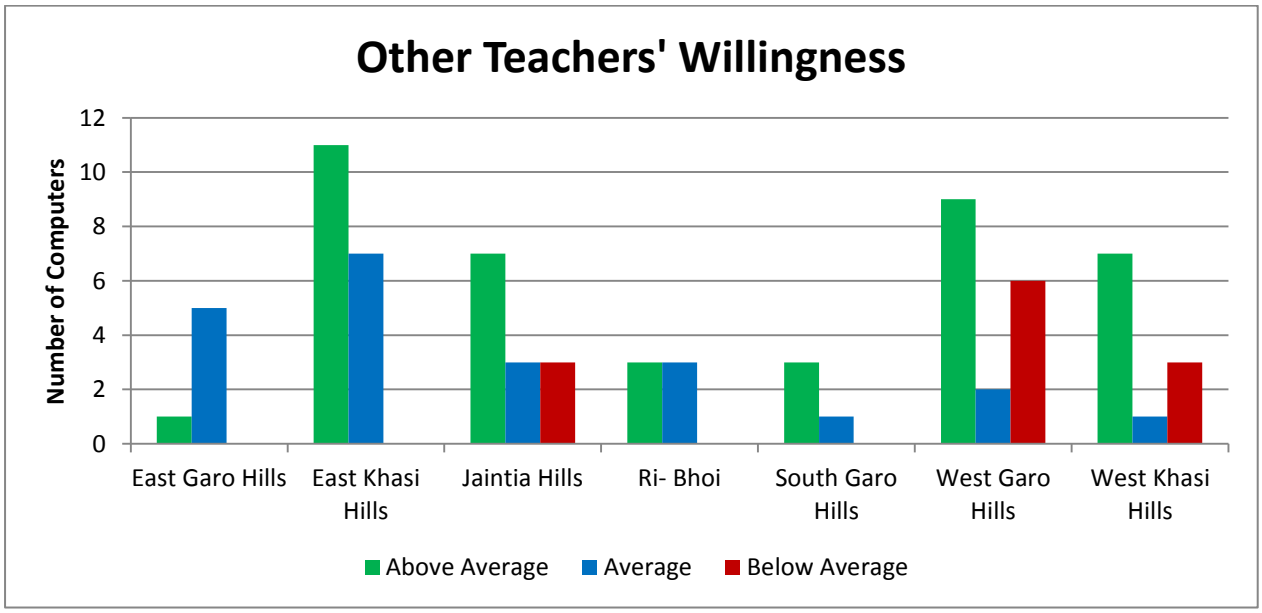

Students' Performance - Other Subjects
Number of Schools
16
14
12
10
8
6
4
2
0
East Garo Hills
East Khasi Hills
Jaintia Hills
Ri- Bhoi
South Garo Hills
West Garo Hills
West Khasi Hills
Above Average
Average
Below Average

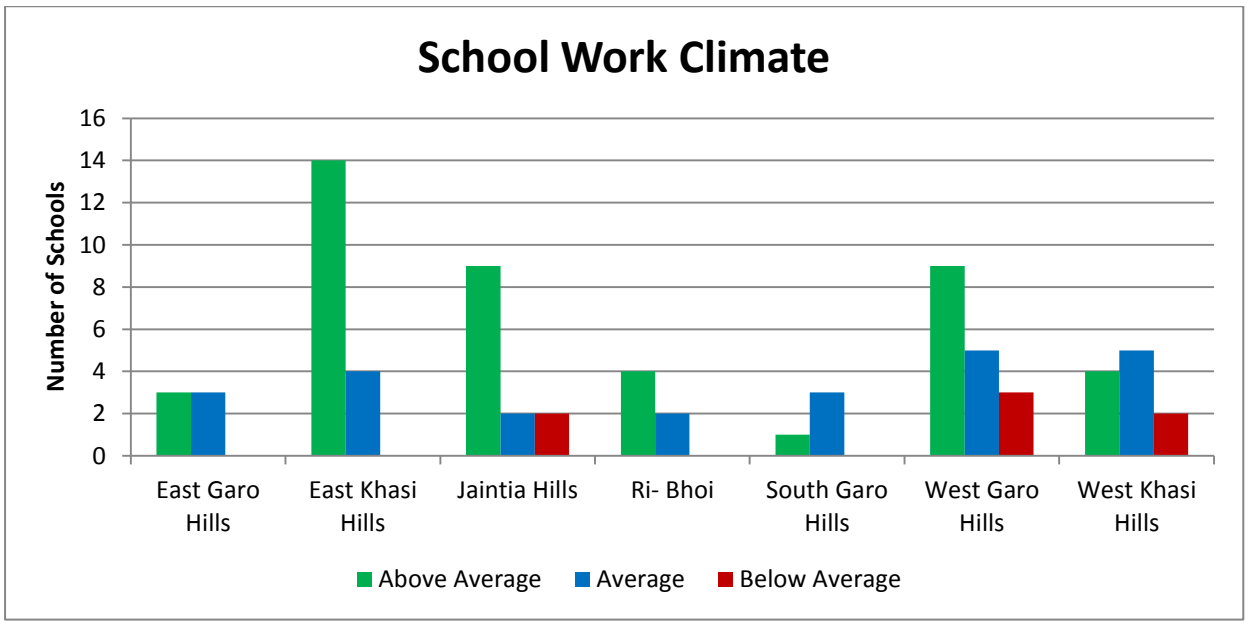

Students' Performance - Computers
Number of Schools
14
12
10
8
6
4
2
0
East Garo Hills
East Khasi Hills
Jaintia Hills
Ri- Bhoi
South Garo Hills
West Garo Hills
West Khasi Hills
Above Average
Average
Below Average

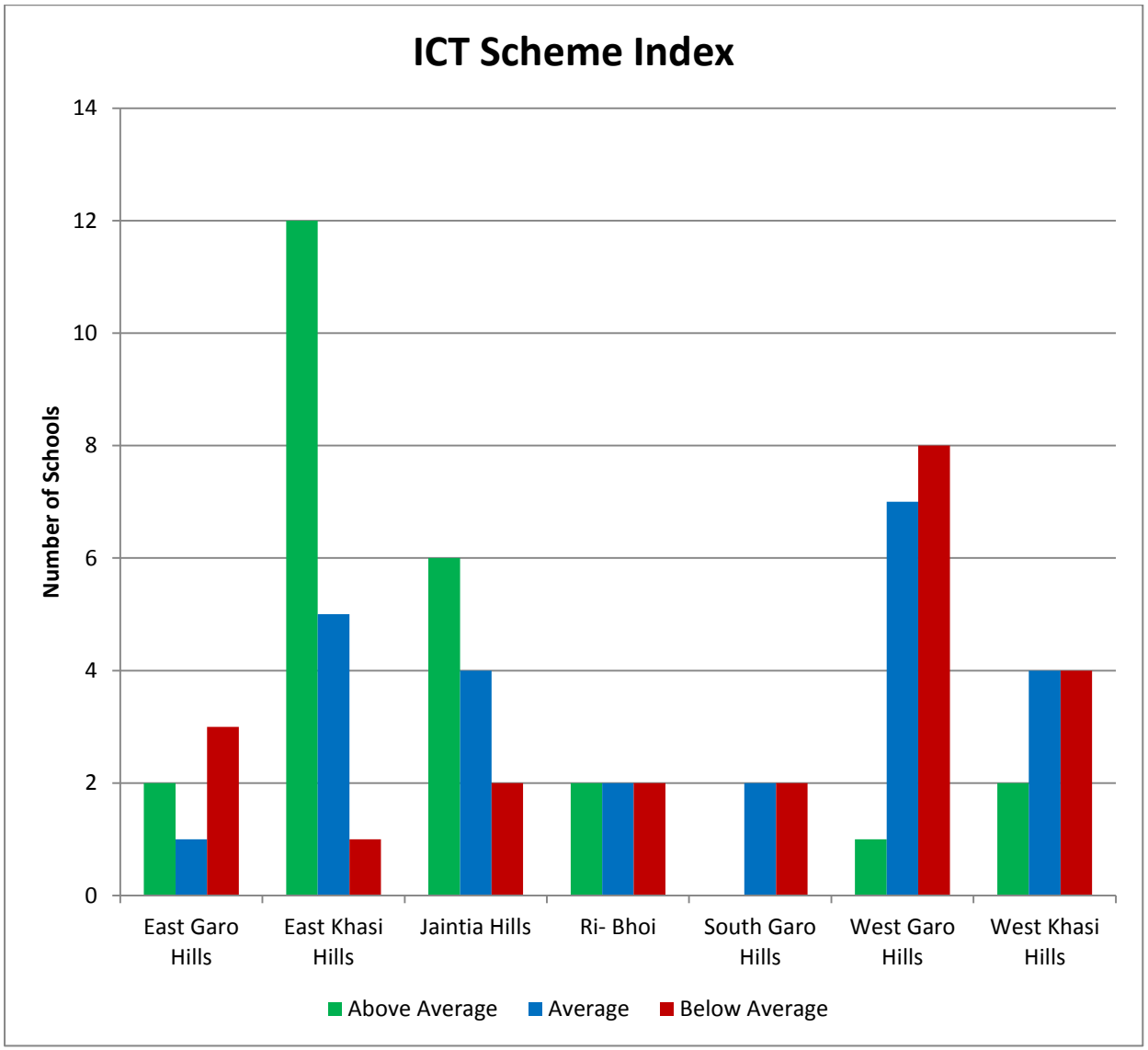

School Facilities - Infrastructure
Number of Schools
14
12
10
8
6
4
2
0
East Garo Hills
East Khasi Hills
Jaintia Hills
Ri- Bhoi
South Garo Hills
West Garo Hills
West Khasi Hills
Above Average
Average
Below Average


Computer Teacher's Willingness
Number of Schools
16
14
12
10
8
6
4
2
0
East Garo Hills
East Khasi Hills
Jaintia Hills
Ri- Bhoi
South Garo Hills
West Garo Hills
West Khasi Hills
Above Average
Average


Computer Teacher's Competence
Number of Schools
14
12
10
8
6
4
2
0
East Garo Hills
East Khasi Hills
Jaintia Hills
Ri- Bhoi
South Garo Hills
West Garo Hills
West Khasi Hills
Above Average
Average
Below Average


Other Teachers' Willingness
Number of Computers
12
10
8
6
4
2
0
East Garo Hills
East Khasi Hills
Jaintia Hills
Ri- Bhoi
South Garo Hills
West Garo Hills
West Khasi Hills
Above Average
Average
Below Average


School Work Climate
Number of Schools
16
14
12
10
8
6
4
2
0
East Garo Hills
East Khasi Hills
Jaintia Hills
Ri- Bhoi
South Garo Hills
West Garo Hills
West Khasi Hills
Above Average
Average
Below Average


ICT Scheme Index
Number of Schools
14
12
10
8
6
4
2
0
East Garo Hills
East Khasi Hills
Jaintia Hills
Ri- Bhoi
South Garo Hills
West Garo Hills
West Khasi Hills
Above Average
Average
Below Average

Appendix 6:

Correlation across Indices

Correlation Table showing inter-index relationships:

		Index 1	Index 2	Index 3	Index 4	Index 5	Index 6	Index 7a	Index 7b	Overall ICT Success Index
		School Receptiveness	Teacher (Computer) Willingness	Teacher (Computer) Competence	Teacher (Others) Willingness	School Work Climate	Outcome 1: School Learning climate	Outcome 2: Students' Other Subject Performance	Outcome 3: Students' Computer Subject Performance	Overall ICT Scheme Index
School Receptiveness	Pearson Correlation	1.000	.158	.374**	-.177	.293*	.153	.332**	.414**	.453**
	Sig. (2-tailed)		.260	.003	.163	.015	.226	.007	.001	.000
	N	71.000	53	62	64	68	64	64	64	71
Teacher (Computer) Willingness	Pearson Correlation	.158	1.000	-.054	-.201	-.014	.060	-.021	-.031	-.121
	Sig. (2-tailed)	.260		.696	.166	.919	.684	.888	.834	.385
	N	53	54.000	54	49	54	49	49	49	54
Teacher (Computer) Competence	Pearson Correlation	.374**	-.054	1.000	-.031	.398**	.225	.329*	.277*	.507**
	Sig. (2-tailed)	.003	.696		.821	.001	.092	.012	.037	.000
	N	62	54	64.000	57	62	57	57	57	63
Teacher (Others) Willingness	Pearson Correlation	-.177	-.201	-.031	1.000	.034	-.076	-.132	-.103	-.094
	Sig. (2-tailed)	.163	.166	.821		.787	.554	.304	.420	.459
	N	64	49	57	64.000	64	63	63	63	64
School Work Climate	Pearson Correlation	.293*	-.014	.225	-.076	1.000	.014	.179	.221	.717**
	Sig. (2-tailed)	.015	.919	.092	.554		.914	.156	.079	.000
	N	68	54	57	63	69.000	64	64	64	69
School Learning climate	Pearson Correlation	.153	.060	.225	-.076	.014	1.000	.409**	.344**	.336**
	Sig. (2-tailed)	.226	.684	.092	.554	.914		.001	.005	.007
	N	64	49	57	63	64	64.000	64	64	64
Students' Other Subject Performance	Pearson Correlation	.332**	-.021	.329*	-.132	.179	.409**	1.000	.845**	.610**
	Sig. (2-tailed)	.007	.888	.012	.304	.156	.001		.000	.000
	N	64	49	57	63	64	64	64.000	64	64
Students' Computer Subject Performance	Pearson Correlation	.414**	-.031	.277*	-.103	.221	.344**	.845**	1.000	.640**
	Sig. (2-tailed)	.001	.834	.037	.420	.079	.005	.000		.000
	N	64	49	57	63	64	64	64	64.000	64
Overall ICT Scheme Index	Pearson Correlation	.453**	-.121	.507**	-.094	.717**	.336**	.610**	.640**	1.000
	Sig. (2-tailed)	.000	.385	.000	.459	.000	.007	.000	.000	
	N	71	54	63	64	69	64	64	64	72.000

****. Correlation is significant at the 0.01 level (2-tailed).**

***. Correlation is significant at the 0.05 level (2-tailed).**

Appendix 7:

Survey Questionnaires

FORM 1A

Evaluation of the Scheme for Information and Communication Technology (ICT) @ Schools

Conducted by Indian Institute of Management Shillong

To The Principal,

Indian Institute of Management, Shillong is conducting a survey of schools in Meghalaya at the behest of the Government of Meghalaya regarding the Scheme for Information and Communication Technology (ICT) @ schools.

In this regard, we request you to answer some questions which will help us understand the teaching-learning processes and the associated problems and how they can be improved.

This is a survey of some of the schools in Meghalaya and hence the findings will not reflect anything in particular about your school or any person in specific.

However, we may use any positive information and highlight the same to bring out the achievements.

The Survey will be undertaken in 2 phases. First we shall try to understand basic facts about your school through the telephone/email and second we shall visit you shortly to understand you better.

The questionnaire consists of a total of **43** items and will take about 30 minutes to complete.

You may choose to answer all the school related questions by yourself and/or authorize any teacher to do so on your behalf.

Please confirm whether the same is acceptable to you and help us understand the schools of Meghalaya.

1.	Name of the school		
2.	Address of the school		
3.	May we know your name please? (if the respondent is the Principal) Or What is the name of the Principal? (if the respondent is not the Principal)		
4.	Would you please let us know your qualification? (if the respondent is the Principal) Or What is the qualification of the Principal? (if the respondent is not the Principal)		
5.	What is your Email Id?(if the respondent is the Principal) Or What is the Email id of the Principal? (if the respondent is not the Principal)		
6.	School office phone no.		
7.	Email id of the school		
8.	What is the year of Establishment of the school?		
9.	What is the nature of the school?	1) Government 2) Deficit 3) Government Aided 4) Trust 5) Society 6) Community 7) Missionary funded 8) Any other	
10.	What are the different sources of funding for your school?	1) State Govt. 2) Sarva Shiksha Abhiyan (SSA) 3) Church 4) Local Durbar 5) Self-funded 6) Any Other	
11.	What is the enrollment structure?	1) Co-ed 2) All Boys 3) All Girls	Total Number: _____ Number of Boys: _____ Number of Girls:_____
12.	Which classes are taught in the school?		
13.	How many students appeared for HSLC in 2010?		

14.	How many students passed in HSLC in 2010?		
15.	What is the total number of teachers in the school?	1) Regular – Full Time _____ 2) Regular – Contract _____ 3) Part Time _____ 4) Any Other _____	
16.	Who is conducting the computer classes in the school?	1) Teacher provided by Aces Infotech	2) Teacher appointed by the school
17.	Is the computer teacher from the same locality?	1) Yes	2) No
18.	**What is the mobile number of the computer teacher?**		
19.	Is the first computer teacher appointed by Aces Infotech still present in the school?	1) Yes	2) No
	a) If No, what is the reason for leaving?		
20.	How many of your school teachers were able to learn computers from the Aces Infotech's appointed computer teacher? (Number)		
	a) Were formal training sessions organized for the above purpose?	1) Yes	2) No
	b) Are the other subject teachers interested in learning computers?	1) Yes	2) No
21.	Does the school follow a timetable?	1) Yes	2) No
	a) If No, how are the classes scheduled?		
	b) What is the duration of a class?		
22.	Do you have an academic calendar for the school?	1) Yes	2) No
23.	Is there an attendance register?	1) Yes	2) No
24.	What is the total number of computers in the school?		
	a) How many of these are from the ICT Scheme?		
25.	Did the school receive computers from any other sources?	1) Yes	2) No
	a) What are these other sources from where the computers were received?	1) NEC 2) Self-financed 3) Donation/Sponsor 4) Others	
26.	Does the school office have a computer?	1) Yes	2) No
	a) What is the computer in the office used for?	1) Typing letters 2) Typing question papers 3) Record of salaries 4) Record of accounts 5) Maintaining students' records	

27.	How many types of computer equipment does the office have?	1) Computer ____ 2) Scanner ___ 3) Printer ____	From ICT Project: Yes/No From ICT Project: Yes/No From ICT Project: Yes/No
28.	Does the school have a library	1) Yes	2) No
	a) Is there library periods for students?	1) Yes	2) No
	b) Does the library has a computer?	1) Yes	2) No
	c) Is the computer in library taken from ICT Scheme?	1) Yes	2) No
29.	How many computer labs are there?	1) One	2) More
30.	Do teachers of other subjects use the computer lab?	1) Yes	2) No
31.	What is/are the computer lab(s) used for? (Tick as many as applicable)	1) Teaching regular computer classes 2) Project work by students for other subjects 3) Teaching other subjects 4) Teaching people from the locality 5) Running computer courses for others on payment 6) Others	
32.	For which classes is computer course compulsory?	1) Class 5-8 2) Class 5 – 10 3) Class 5 – 12 4) Others 5) None	
33.	How many computers practical sessions does a class get in a week?	1) Zero	2) One	3) Two	4) More
34.	How many times can an individual student use the computer in a month?	1) Zero	2) One	3) Two	4) More
35.	When do the students have access to computer lab? *(Interviewer to tick as many as applicable)*	1) During practical classes 2) Anytime when computer teacher is present 3) Anytime during the day 4) After school hours 5) During holidays	
36.	How many students with special needs are there in your school?		
37.	How many of these special need children have joined the computer class?		
38.	Since ICT was implemented, has the student attendance improved?	1) Yes	2) No
39.	When the ICT project was discontinued for sometime, what happened to the computer classes?	1) Classes were discontinued 2) Classes continued and computer teacher was unpaid 3) Classes continued and computer teacher was paid by school 4) Other	

40.	Have you received educational CDs from Aces Software?	1) Yes	2) No
	a) If yes, when did you receive them?		
	b) Have you seen them?	1) Yes	2) No
	c) Has the computer teacher gone through all of them?	1) Yes	2) No
	d) Has the subject teacher seen them?	1) Yes	2) No
	e) Have the student been exposed to the contents of the CD?	1) Yes	2) No
	f) Do the students refer to the CD?	1) Yes	2) No
41.	What teaching aids does the school have? (Tick as many as applicable)	1) Globe 2) Maps 3) Charts 4) Models 5) Other	
42.	Which of the following equipments does your school have?		
	a) Public address system	1) Yes	2) No
	b) Internal announcement system	1) Yes	2) No
	c) LCD projectors	1) Yes	2) No
	d) EDUSAT facility	1) Yes	2) No
43.	Does the school have internet facility?	1) Yes	2) No

THANK YOU

FORM 1

Self-Administered / Assisted Questionnaire

Survey @ Schools

Conducted by Indian Institute of Management Shillong

To

The Principal,

Indian Institute of Management, Shillong is conducting a survey of schools in Meghalaya at the behest of the Government of Meghalaya regarding the Scheme for Information and Communication Technology (ICT) @ schools.

In this regard, we request you to kindly fill in this questionnaire which will help us understand the teaching-learning processes with their associated problems and how they can be improved.

This is a survey of some of the schools in Meghalaya and hence the findings will not reflect anything in particular about you or your school.

However, we may use any positive information and highlight the same to bring out the achievements.

The questionnaire consists of a total of **30** items and will take about 45 minutes to complete.

Please sign below to confirm whether the same is acceptable to you and help us understand the schools of Meghalaya.

You may choose to answer all the school related questions by yourself and/or authorize any teacher to do so on your behalf.

Signature: (Principal/Head/Secretary)

Instructions to Interviewer:

Try interviewing the concerned person on the following questions and also verify the same yourself from the computer lab/room.

Call out the question to the respondent and fill the items yourself as applicable. You are also required to take a copy of the following documents if available:

1) Time Table for classes 5, 8, 10, 12
2) Course Outline for classes 5, 8, 10, 12
3) Curriculum for classes 5, 8, 10, 12
4) Annual Reports of the last 3 years
5) Academic Calendar of the last/current year

The School					
1.	Name of the school				
2.	Address of the school				
3.	School office phone no.				
4.	Email id of the school				
5.	Location of school	1) Urban		2) Rural	
6.	No. of sections per class	**Class**	**No. of sections**	**No. of Boys**	**No. of Girls**
		I			
		II			
		III			
		IV			
		V			
		VI			
		VII			
		VIII			
		IX			
		X			
		XI			
		XII			
7.	Details of Funding	**Funding Source**		**Amount/Percentage**	
		1) State Govt.			
		2) Sarv Shiksha Abhiyan			
		3) Church			
		4) Local Durbar			
		5) Any Other			
8.	Heads and amount of expenditure	**Expenditure Heads**		**Amount/Percentage**	
		1) Salary & Wages			
		2) Midday Meal			
		3) Library			
		4) Sports			
		5) Other			
9.	Details of school physical infrastructure? (Please answer as many as applicable)				
	a) No. of Buildings Owned				
	b) No. of Buildings Rented				
	c) No. of class rooms				
	d) No. of office rooms				
	e) No. of bathrooms for boys				
	f) No. of Bathrooms for girls				
	g) No. of common rooms				
	h) No. of playgrounds				

Teachers			
10.	Details of teachers	No. of teachers	Number knowing computers
		Science : _____	
		Math : _____	
		English : _____	
		Computer : _____	
11.	Number of teachers having computer at home		
12.	Number of times teacher training organized/ teachers sent for training in last two years		
	If not zero, indicative list of topics/subjects/areas in which such training has been provided		
	Number of teachers who had participated in such training over the last two years		
School administration			
13.	Number of Managing Committee (MC) Members		
	Frequency of MC Meetings	1) Weekly 2) Monthly 3) Quarterly 4) Bi-Annually 5) Annually 6) Others _____	
	Number of local community members in MC		
	Is local headman a member of MC	1) Yes	2) No
	Number of teachers in MC		
14.	Frequency of Parent Teacher meetings	1) Weekly 2) Monthly 3) Quarterly 4) Bi-Annually 5) Annually 6) Others _____	
ICT @ Schools			
15.	Do you have a separate room/lab for the computers under the ICT scheme?	1) Yes	2) No
16.	Do the teachers of the school need permission to use the computer lab?	1) Yes	2) No
17.	Is the computer lab accessible to	1) Yes	2) No

	all teachers?					
18.	For training other teachers to use computers, were any formal training session organized?	1) Yes			2) No	
	Please provide details of the training	1) Duration _____ 2) No. of participants _____ 3) No. of times training was conducted _____ 4) Any other: _____				
19.	The computer instructor has taken classes throughout since joining	Never	Rarely	Often	Mostly	All the time
20.	The students find the classes interesting	Strongly Agree	Agree	No opinion	Disagree	Strongly Disagree
21.	The other teachers come to the computer lab	Strongly Agree	Agree	No opinion	Disagree	Strongly Disagree
22.	The other teachers are interested in learning computers	Strongly Agree	Agree	No opinion	Disagree	Strongly Disagree
23.	The school promotes the use of ICT to the students through	1) Notice Board Display 2) Debates on ICT 3) Open House discussion 4) Assembly Announcement 5) None				
24.	ICT educational CD's are useful to teach other subjects in the school	Strongly Agree	Agree	No opinion	Disagree	Strongly Disagree
25.	The students take initiative to use computers on their own	Strongly Agree	Agree	No opinion	Disagree	Strongly Disagree
26.	No. of students with special needs					
27.	No. of students with special needs who joined the computer class					
28.	Learning computers has helped students with special needs in the school	Strongly Agree	Agree	No opinion	Disagree	Strongly Disagree
29.	Since ICT was implemented, the student attendance has improved	Strongly Agree	Agree	No opinion	Disagree	Strongly Disagree
30.	Which of the following equipments does your school have?	1) Public address system 2) Internal announcement system 3) LCD projectors 4) EDUSAT facility 5) Any Other				
	If you have the above equipments, what is the frequency of use and what are they used for?	**Frequency**			**Used for**	
	a) Public address system	1) Daily 2) Twice a week 3) Once in two weeks 4) Once in a month 5) Less frequently				

	b) Internal announcement system	1) Daily 2) Twice a week 3) Once in two weeks 4) Once in a month 5) Less frequently	
	c) LCD projectors	1) Daily 2) Twice a week 3) Once in two weeks 4) Once in a month 5) Less frequently	
	d) EDUSAT facility	1) Daily 2) Twice a week 3) Once in two weeks 4) Once in a month 5) Less frequently	
	e) Any Other	1) Daily 2) Twice a week 3) Once in two weeks 4) Once in a month 5) Less frequently	

THANK YOU

FORM 2A

Survey @ Schools

Conducted by Indian Institute of Management Shillong

To

The Computer Science Teacher,

Indian Institute of Management, Shillong is conducting a survey of schools in Meghalaya at the behest of the Government of Meghalaya regarding the Scheme for Information and Communication Technology (ICT) @ schools.

In this regard, we request you to answer some questions which will help us understand the teaching-learning processes and the associated problems and how they can be improved.

This is a survey of some of the schools in Meghalaya and hence the findings will not reflect anything in particular about your school or any person in specific.

However, we may use any positive information and highlight the same to bring out the achievements.

The Survey will be undertaken in 2 phases. First we shall try to understand basic facts about your achievements and challenges through the telephone and second we shall visit you shortly to understand you better.

The questionnaire consists of a total of **27** items and will take about 30 minutes to complete.

Please feel free to ask us for clarifications while answering on the phone. In case a question is not clear to you, please ask me to repeat the same. Some questions may have more than one option. I will read out the options for you to decide on the one you feel appropriate in your case.

Please note that in case the line gets disconnected in between, I shall call you back.

Name and Signature of Interviewer with Date

Time call started: .....

Time call ended: .....

Breaks if any: .....

If teacher busy, to call at what date/ time later? .....

If further clarifications needed, to call at what date/ time later? .....

1.	Name of the school					
2.	Address of the school					
3.	May we kindly know your name?					
4.	Telephone/Mobile number					
5.	When did you join the school?					
6.	How far is the school from your residence in km?					
7.	What is your highest qualification?					
8.	What was the last educational institution you attended?					
9.	Are you appointed by Aces Software?	1) Yes			2) No	
	a) If yes, whether you were trained by ACES Software?	1) Yes			2) No	
	b) If joined last year, what did you do during the last few months of 2010 when ACES Software was not paying your salary?	1) Stopped teaching 2) Teacher from other subject taught computer 3) Continued teaching with salary paid by school 4) Continued teaching without salary 5) Others _____				
10.	How prompt/regular is the payment of salary to you?	Very regular	Regular	Somewhat regular	Irregular	Very Irregular
11.	Have you trained other teachers?	1) Yes		2) No		
12.	To what extent do you think other teachers are interested in learning computers	Very keen	Keen	Somewhat keen	Slightly keen	Not at all
13.	How many students have computers at home?					
14.	What are the resources at the school?					

	Resource	**Total No.**	**How many out of order?**	**How many are lost/stolen?**
	Computer			
	Printer			
	Scanner			
	Web Camera			

15.	Does the school have internet connectivity?	1) Yes		2) No	
	a) If 'Yes' then what is the type of connectivity?	1) Dial Up	2) Broadband	3) Other	
	b) If yes, what is the Bandwidth?	1) 56 kbps 2) 256kbps 3) 512 kbps 4) 1 Mbps 5) Other			
16.	How many times do you face Hardware problems in a month?	1) 0	2) 1-2	3) 3-5	4) 6-10	5) More than 10
17.	To what extent are you able to sort out hardware problems by yourself?	Almost every time		Sometime	Seldom	Never
	a) If you cannot solve the	1) Call up Aces Software district coordinator				

	problem, what do you do?	2) Call up Aces Software State coordinator 3) Inform the Principal 4) Leave it as it is, since there is no one to repair 5) Others _____				
18.	How many times do you face software problems in a month?	1) 0	2) 1-2	3) 3-5	4) 6-10	5) More than 10
19.	To what extent are you able to sort out your software problems?	Almost every time		Sometime	Seldom	Never
	a) If you cannot solve the problem, what do you do?	1) Call up Aces Software district coordinator 2) Call up Aces Software State coordinator 3) Inform the Principal 4) Leave it as it is, since there is no one to repair 5) Others _____				
20.	How many computers have been provided by Aces Software?					
21.	How many printers have been provided by Aces Software?					
22.	How many scanners have been provided by Aces Software?					
23.	Are the computers in the lab networked?	1) Yes		2) No		
	a) Is the networking really helping you?	1) Yes		2) No		
	b) If 'Yes' how?					
24.	Are the students allowed to play computer games in the lab?	1) Yes		2) No		
	a) If 'Yes' specify some of them					
25.	What number of students has enrolled (class wise) in computers in the present batch?	Class	No. of boys	No. of girls		
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
26.	Are there power cut problems?	1) Yes		2) No		
	a) If yes, how frequent is the power cut?	Very frequently	Frequently	Sometimes	Seldom	Never
	b) Once there is a power cut, how long does it usually take for the power to be restored?	1) Less than 1 hour 2) 1 to 2 hours 3) 2 to 3 hours 4) 4 hours or more				
27.	Is a generator available?	1) Yes		2) No		
	a) If yes, how often is the generator switched on every time there is power cut?	Every time	Sometime	When required	When extremely necessary	

FORM 2

Self-Administered / Assisted Questionnaire

Survey @ Schools

Conducted by Indian Institute of Management Shillong

To

The Computer Science Teacher,

Indian Institute of Management, Shillong is conducting a survey of schools in Meghalaya at the behest of the Government of Meghalaya regarding the Scheme for Information and Communication Technology (ICT) @ schools.

In this regard, we request you to kindly fill in this questionnaire which will help us understand the teaching-learning processes with their associated problems and how they can be improved.

This is a survey of some of the schools in Meghalaya and hence the findings will not reflect anything in particular about you or your school.

However, we may use any positive information and highlight the same to bring out the achievements.

The questionnaire consists of a total of **73** items and will take about 30 minutes to complete.

Personal Information			
1.	Name of the school		
2.	Address of the school		
3.	Name of Computer Teacher		
4.	Gender		
5.	Age		
6.	Highest qualification		
7.	Years of teaching experience		
8.	Resident of which town/Village along with District		
9.	Distance of school from home (in km)		
10.	Appointed by	1) Aces Software	2) School
Computers @ school			
11.	How many computers have webcam?		
12.	If not zero, do you find the webcam helpful?	3) Yes	4) No
13.	If yes, what do you use them for?		
14.	How many scanners do you have		
15.	If not zero, do you find the scanner helpful?	1) Yes	2) No
16.	If yes, what do you use them for?		
17.	Is there a modem at school?	1) Yes	2) No
18.	Do you have Internet functioning?		
	If yes, what is it used for	1) I use it to check my emails 2) Other teachers use it to check their emails 3) Students use it to check their emails 4) I use it to find information for my classes 5) Other teachers use it to find information for their classes 6) Students use it for playing games 7) Students use it for their projects in other subjects 8) Others _____	
19.	Are you benefiting from the computer networks?	1) Yes	2) No
	If yes, how are you using the computer network?		

School and the Scheme						
20.	I feel the need to undergo further training in computers	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
21.	If Agree, in which domains	1) DOS 2) Computer Fundamentals 3) Microsoft Excel 4) Microsoft Word 5) Programming in QBASIC 6) HTML 7) Programming in C 8) Others _____				

		Strongly Agree (1)	Agree (2)	No Opinion (3)	Disagree (4)	Strongly Disagree (5)
22.	The school authorities, to a great extent, know the importance of ICT in school education	1	2	3	4	5
23.	The school authorities encourage the learning of computers	1	2	3	4	5
24.	The resources provided under the ICT Scheme are sufficient for this school	1	2	3	4	5
25.	The administration of this school does not understand the importance of teaching computers in school	1	2	3	4	5
26.	I believe that the ICT scheme can change the teaching methods	1	2	3	4	5
27.	The ICT scheme provides other valuable resources to encourage student learning	1	2	3	4	5
28.	The ICT Scheme has improved student skills	1	2	3	4	5
29.	I don't think that the ICT scheme is useful	1	2	3	4	5
30.	This ICT scheme could have been implemented in a better way than what it has been	1	2	3	4	5

Teaching/learning computers			
31.	My role in the school is to help the students in: (Please tick as many applicable)	1) Self-learning 2) Explore computers 3) Mastering Computer Skills 4) Expressing doubts about computers 5) Analyzing complex problems	
32.	I also try to learn more to improve my knowledge and skills	1) Yes	2) No
33.	If yes, which books/sources do you refer to		

34.	I feel that teaching about computers as compared to other subjects is	Very difficult	Difficult	Neither difficult nor easy	Easy	Very Easy
	What are the reasons why you say the above?					
35.	As compared to other subjects, in order to teach computers the style has to be	Unique	Very Different	Different	Some what similar	Same

Me and My School		Strongly Agree (1)	Agree (2)	No Opinion (3)	Disagree (4)	Strongly Disagree (5)
36.	I am happy with the overall benefits in this job	1	2	3	4	5
37.	The people around me in this school are friendly	1	2	3	4	5
38.	I have a lot of freedom to do my job	1	2	3	4	5
39.	In this job, I have opportunities to learn new things	1	2	3	4	5
40.	People around me in the school trust me	1	2	3	4	5
41.	Here in this school, I have chances to do something worthwhile	1	2	3	4	5
42.	I am satisfied with my salary	1	2	3	4	5
43.	Teaching gives me opportunities to do things that make me feel good as a person	1	2	3	4	5
44.	Administration in the school treats me well	1	2	3	4	5
45.	I am sometimes involved in taking decisions	1	2	3	4	5
46.	I feel that I have a secure job	1	2	3	4	5
47.	I feel emotionally connected with the school	1	2	3	4	5
48.	I am comfortable with the work conditions in the school	1	2	3	4	5
49.	I share a good rapport with my students	1	2	3	4	5
50.	I feel motivated when I see my students improving	1	2	3	4	5
51.	The present school policies hinder my work	1	2	3	4	5
52.	I enjoy teaching	1	2	3	4	5
53.	I feel there are growth opportunities for me as a computer teacher	1	2	3	4	5

Me and Computer		Excellent (1)	Good (2)	Satisfactory (3)	Little (4)	Very little (5)
54.	My knowledge of computer basics is	1	2	3	4	5
55.	My knowledge of computer operating system is	1	2	3	4	5
56.	My knowledge of Internet is	1	2	3	4	5
57.	My knowledge of Microsoft Word is	1	2	3	4	5
58.	My knowledge of Microsoft Excel is	1	2	3	4	5
59.	My knowledge of website development and HTML is	1	2	3	4	5

60.	My knowledge of Microsoft PowerPoint is	1	2	3	4	5
61.	My knowledge about programming in QBasic is	1	2	3	4	5
62.	My knowledge about programming in C is	1	2	3	4	5

63. What do the following icons indicate in Windows Vista?

a)		
b)		

64. What do the following icons indicate in Microsoft Word?

a)		
b)		
c)		
d)		
e)		
f)		
g)		
h)		
i)		

65. What do the following icons indicate in Microsoft Excel?

a)		
b)		

c)		

66. What do you understand by the following?

a)	Programming	
b)		
c)		
d)	 	
e)	<H1></H1>	
f)	#include<stdio.h>	
g)	#DEFINE x 3	
h)	Comma Operator	
i)	5/2=2 and not 2.5	
j)	Function Prototype	

The ICT Scheme @ School		
67.	In my opinion, this school needs to have more of these as the numbers we have is not enough: (Please tick as many as applicable)	1) No. of computers 2) No. of printers 3) No. of scanners 4) No. of CRT's 5) Educational Software 6) Computer Stationery 7) Internet 8) Any other _____ 9)

68. What do you think can increase the use of computers in other subjects in this school?
69. What specific difficulties are you facing in teaching computers in this school?
70. What problems do you think the students have in learning computers?
71. What would you like to recommend to be improved in order to enhance computer literacy in the school?

72. What would you like to recommend to be done to increase computer awareness in your community?
73. Any think else you would like to tell us?

THANK YOU

FORM 3

Self-Administered / Assisted Questionnaire

Survey @ Schools

Conducted by Indian Institute of Management Shillong

To

The Teacher,

Indian Institute of Management, Shillong is conducting a survey of schools in Meghalaya at the behest of the Government of Meghalaya regarding the Scheme for Information and Communication Technology (ICT) @ schools.

In this regard, we request you to kindly fill in this questionnaire which will help us understand the teaching-learning processes with their associated problems and how they can be improved.

This is a survey of some of the schools in Meghalaya and hence the findings will not reflect anything in particular about you or your school.

However, we may use any positive information and highlight the same to bring out the achievements.

The questionnaire consists of a total of **51** items and will take about 25 minutes to complete.

Personal Information			
1.	Name of the school		
2.	Address of the school		
3.	Gender		
4.	Age		
5.	Highest qualification		
6.	Years of teaching experience		
7.	Resident of which town/Village along with District		
8.	Distance of school from home (in km)		
Computers @ school			
9.	Are you benefiting from the computer in your school?	1) Yes	2) No
	If yes, how are you using them?		

School and the Scheme		Strongly Agree (1)	Agree (2)	No Opinion (3)	Disagree (4)	Strongly Disagree (5)
10.	I feel the need to undergo training in computers	1	2	3	4	5
11.	The school authorities, to a great extent, know the importance of ICT in school education	1	2	3	4	5
12.	The school authorities encourage the learning of computers	1	2	3	4	5
13.	The resources provided under the ICT Scheme are sufficient for this school	1	2	3	4	5
14.	The administration of this school does not understand the importance of teaching computers in school	1	2	3	4	5
15.	I believe that the ICT scheme can change the teaching methods	1	2	3	4	5
16.	The ICT scheme provides other valuable resources to encourage student learning	1	2	3	4	5
17.	The ICT Scheme has improved student skills	1	2	3	4	5
18.	I don't think that the ICT scheme is useful	1	2	3	4	5
19.	This ICT scheme could have been implemented in a better way than what it has been	1	2	3	4	5
Teaching/learning computers						
20.	My role in the school is to help the students in:	1) Self-learning 2) Explore computers 3) Expressing doubts about computers				

	(Please tick as many applicable)	4) Analyzing complex problems	
21.	I also try to learn more to improve my knowledge and skills	1) Yes	2) No
22.	If yes, which books/sources do you refer to		

Me and My School		Strongly Agree (1)	Agree (2)	No Opinion (3)	Disagree (4)	Strongly Disagree (5)
23.	I am happy with the overall benefits in this job	1	2	3	4	5
24.	The people around me in this school are friendly	1	2	3	4	5
25.	I have a lot of freedom to do my job	1	2	3	4	5
26.	In this job, I have opportunities to learn new things	1	2	3	4	5
27.	People around me in the school trust me	1	2	3	4	5
28.	Here in this school, I have chances to do something worthwhile	1	2	3	4	5
29.	I am satisfied with my salary	1	2	3	4	5
30.	Teaching gives me opportunities to do things that make me feel good as a person	1	2	3	4	5
31.	Administration in the school treats me well	1	2	3	4	5
32.	I am sometimes involved in taking decisions	1	2	3	4	5
33.	I feel that I have a secure job	1	2	3	4	5
34.	I feel emotionally connected with the school	1	2	3	4	5
35.	I am comfortable with the work conditions in the school	1	2	3	4	5
36.	I share a good rapport with my students	1	2	3	4	5
37.	I feel motivated when I see my students improving	1	2	3	4	5
38.	The present school policies hinder my work	1	2	3	4	5
39.	I enjoy teaching	1	2	3	4	5
40.	I feel there are growth opportunities for me as a computer teacher	1	2	3	4	5

Me and Computer		Excellent (1)	Good (2)	Satisfactory (3)	Little (4)	Nil (5)
41.	My knowledge of computer basics is	1	2	3	4	5
42.	My knowledge of Internet is	1	2	3	4	5
43.	My knowledge of Microsoft Word is	1	2	3	4	5
44.	My knowledge of Microsoft Excel is	1	2	3	4	5
45.	My knowledge of Microsoft PowerPoint is	1	2	3	4	5
46.	My knowledge about programming is	1	2	3	4	5

The ICT Scheme @ School	
47. In my opinion, this school needs to have more of these as the numbers we have is not enough: (Please tick as many as applicable)	1) No. of computers 2) No. of printers 3) No. of scanners 4) No. of CRT's 5) Educational Software 6) Computer Stationery

	7) Internet 8) Any other _____ 9)
48. What do you think can increase the use of computers in your subject in this school?	
49. What would you like to recommend to be improved in order to enhance computer literacy in the school?	
50. What would you like to recommend to be done to increase computer awareness in your community?	
51. Any think else you would like to tell us?	

THANK YOU

'AT

FORM 4

Self-Administered

Survey @ Schools

Conducted by Indian Institute of Management Shillong

Dear Student

Please answer the following questions.

School: ..... Class: .....

1.	I find working in the computers interesting					
2.	I don't think learning computers is very important					
3.	Learning about computers will help me in future					
4.	Computers have no connections with other subjects					
5.	Learning about computers does not need any knowledge of any other subject					
6.	Working in computers is very boring					
7.	Working on computers is interesting only when the internet is connected					
8.	I find the internet informative					
9.	My friends tell me more about computers and internet then what I do in class					
10.	Computers classes are very exciting to attend					
11.	Coming to school is real fun					
12.	I feel my school is the best					
13.	I don't feel like coming to school everyday					
14.	Teachers are the real source of inspiration for me					
15.	In my school there is an overemphasis on learning from the books					
16.	Teachers in my school encourage us to take part in extra-curricular affairs					
17.	I like morning assembly					
18.	We have lots of space for sports and playing recess and tiffin time					

19.	I have a group of every goods friends in school					
20.	My parents force me to go to school					
21.	Other children in this school do not like to be here					
22.	I like to share my tiffin with my friends					
23.	My class teacher favors other students in my class					
24.	Other children love coming to school					
25.	The school feels like a police jail to me					
26.	We get to learn a lot of things in our school					
27.	Our school is not best in our region					
28.	Our teacher are very strict					
29.	I don't like the way the teachers behave with me					
30.	Best things in the school is:					
	a) Friends					
	b) Teachers					
	c) Games					
	d) Books					

31. What do the following icons indicate in Windows Vista?

a)		
b)		

32. What do the following icons indicate in Microsoft Word?

a)		
b)		
c)		
d)		

e)		
f)		
g)		
h)		
i)		

33. What do the following icons indicate in Microsoft Excel?

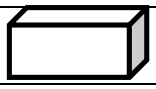
a)		
b)		
c)		

34. What do you understand by the following?

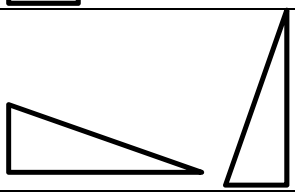
a)	Programming	
b)		
c)		
d)	 	
e)	<H1></H1>	
f)	#include<stdio.h>	
g)	#DEFINE x 3	
h)	Comma Operator	

i)	5/2=2 and not 2.5	
j)	Function Prototype	

35. For the following questions, tick on the correct option on the right column?

a)		i. This is a 2D (two dimensional) shape ii. This is a 3D (three dimensional) shape		
b)		i. There in only one angle in the picture ii. There are two angles in the picture iii. There are three angles in the picture		
c)		i. The angles in the picture are right angles ii. The angles in the picture are acute angles iii. The angles in the picture are obtuse angles		
d)	$\frac{15}{4} =$	i. 1.75 ii. 2.5 iii. 3.75		
e)	123	i. It is divisible by 2 ii. It is divisible by 3 iii. It is divisible by 7		
f)	5:7	i. Is equal to 3:8 ii. Is equal to 15:21 iii. Is equal to 15:25		
g)	$\frac{2}{3} \div \frac{5}{6} =$	i. $\frac{10}{18}$	ii. $\frac{4}{5}$	iii. $\frac{10}{6}$
h)	$2\frac{3}{7} =$	i. $\frac{6}{7}$	ii. $\frac{17}{7}$	iii. $\frac{3}{14}$
i)	I have deposited Rs 150 for 2 years with an interest rate of 10% (simple interest). What is my principal?	i. 30	ii. 150	iii. 180
j)	A quadriangle is having its opposite sides equal, but all the sides are not equal. If two angles are also equal, but not equal to 90 degrees, then the quadriangle is a	i. Square ii. Rectangle iii. Parallelogram		
k)	India is near which of these latitudes?	i. Tropic of Cancer ii. Equator iii. Tropic of Capricorn		
l)	Which state/country is in the West of Meghalaya	i. Nagaland ii. Assam iii. Bangladesh iv. Tripura		
m)	Arctic Ocean is near the _____	i. South Pole ii. Equator iii. North Pole		

36. Answer the following in the space provided for the same

a)		The sides of this square are 2 metres each. The area of this square is _____
b)		What would you need to check to ensure that these two triangles are congruent?
c)	$6x + 3x = 18$	$x =$ _____
d)	What happens if you leave an iron plate in the moist state for a few days?	
e)	When we put wet cloths in sun, they dry up. Why?	
f)	How do plants get their food?	
g)	-1, -21,12, -78, 31, -89, 90	Arrange these numbers in ascending order (smallest to largest) _____

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