Information and Communication Technology (ICT) in a Hill District of Manipur: An Assessment

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Abstract

The present study is an attempt to explore the extent of availability of Information and Communication Technology (ICT) infrastructures and capacity of the teachers in terms of their ability in using ICT. The study adopted descripted survey design. The population of the study comprises of the Teachers of all the existing Government Higher Secondary Schools in Churachandpur District, Manipur. Data was collected with the help of questionnaire schedule, and observation. The collected data was analysed using frequency counts and percentages. The study revealed lack of basic resources in the form of infrastructure in both hardware and software. Majority of the teachers are capable of using ICT in school education but due to lack of infrastructure there is a gap between ICT infrastructure and capacity of the teachers. The study recommended for sufficient ICT infrastructures with training programmes on ICT to update the teacher's knowledge. During this pandemic a great importance for the provision of internet and other hardware and software components was felt. Teachers suggested for appropriate reform measures or interventions in order to initiate and deal effectively with the situation to ensure that ICT is equally assessable to all the students and teachers. The learners of the post-modern period are more techno-savvy, which demands for expert teachers with technological learning tools to fulfil the expectations and learning needs of the students. The study assessed the ability of the teachers for connecting with the world through web-searching and downloading information, connecting with each other through email services, interacting with ICT by connecting to internet, storage device, connecting different corners, and exposure to a range of hardware and software to provide wider choices and flexibility in the approaches to using ICT. The present research work has observed ICT infrastructures of both hardware and software components such as computers, printers, scanners, projectors, speakers, microphones, computer laboratory, networking, internet, reliable electricity UPS, power generator in schools, landline telephone, fax, cable TV, mobile phone, EDUSAT network with Satellite Interactive Terminals (SIT) or Receive Only Terminals (ROT).

Keywords: ICT infrastructure, effective learning, teacher's capacity/ability, secondary school, hill district.

Introduction

Information and Communication Technology (ICT) is the "modified form" of Information Technology (IT) by Zafar (2019). It is a powerful tool in all aspect of life. It has fundamentally transformed the practice and procedures of all forms of endevours within business, society, governance and in education. It is transforming education from traditional to hybrid and influences the teaching method, learning approaches, scientific research and accessing information. ICTs are devices, tools, resources and services which includes interactive digital, internet and other satellite communication devices. Some of the ICT products relevance to teaching and learning includes radio broadcast, tele-conferencing, email, audio-conferencing, television lessons, audio-visual cassettes, etc. ICT is a field of education; it means teaching and learning with ICT. It has become an absolute necessity in the system of education. It has influence education qualitatively and transformed the overall style and functioning of the educational system and its governance. It empowered and enhances the ability, adoptability, knowledge and surviving skills of students and teachers. ICT has provided our society with vast array of communication capabilities and transformed society into global village.

The government of India since 2014 is giving its best effort in implementing Digital India Programme. ICTs have become an indispensable component in school education and various schemes have been launch from time to time. National Educational Policy (NEP) 2020 is also looking forward to digitally equipped schools, teachers and students. Section 23 of NEP 2020 entitled "technology use and integration" noted a vision for the role of technology to take up in a new and improved education sector. Various initiatives such as development and dissemination of ICT curriculum for students and teachers, ICT text books for class IX, Swayam Prabha, National Academic Depository (NAD), Virtual laboratory, Talk to a Teacher Programme, etc. have been taken up by the Government of India, however, implementation seems to be elusive in the hill districts of Manipur particularly, in Churchandpur District.

Churachandpur District is located at the south western part of the state. It stretches between 93^0 15'E and 94^0 45' E longitude and between 24^0 N and 24^0 30 N latitudes. The district has a mixed population of different tribes such as Thadou, Kuki, Hmar, Gangte, Paite, Mizo, Kom, Smite, Zou, Chothe, Aimol, Mate, Kabui and a small population of Meitei community.

There are seven Government Higher Secondary Schools in different sub-divisions of the district. The schools are:

i) Sagang Higher Secondary School
ii) Kangvai Higher Secondary School
iii) Thanlon Higher Secondary School
iv) Vungjagin Higher Secondary School
v) Parbung Higher Secondary School
vi) Rengkai Higher Secondary School
vii) Churachandpur Higher Secondary School

The study was conducted in all the existing Government Higher Secondary Schools, with an attempt to assess the ICT infrastructures and the ability of the teachers to access the ICT applications in the teaching learning process.

Rational of the Study

ICT infrastructure or digital infrastructure with the supporting elements of both software and hardware has to be made available and accessible. Appropriate rooms or buildings, proper electrical wiring, telephone network and access to internet are essential. Besides, teachers' ability to integrate to supplement the traditional method of teaching and to create innovative learning experience for their students is another important factor. It is required that there has to be significant infrastructures and efficient teachers. In view of this, it is appropriate to study the extent of availability of ICT infrastructure and the ability of the teachers in both software and hardware components and evaluate the status of the capacity of the teachers in terms of their ability for connecting with the world through web-searching and downloading information, ability to use classroom learning technologies, connecting each other through email services, interacting with ICT by connecting to internet, storage devices, exposure to range of hardware and software to provide wider voices and flexibility in the approaches to using ICT. It is imperative to critically analyse on the infrastructures and the capacity of the teachers if there exist a gap between the two variables in the Higher Secondary Schools.

Research Questions

The study analyses the availability and the lack of infrastructures both hardware and software in the Higher Secondary Schools in Churachandpur District. This analysis was given importance as scarcity or inadequacy of the ICT infrastructure as it could be the principal obstacle to integrate ICT into teaching and learning. Another attention of the study was to explore if there was a need for any reform measures or intervention in providing ICT infrastructure and capacity building in the Government Higher Secondary Schools of Churachandpur District. The study addressed the following research questions:

i) Is there scarcities in the ICT infrastructures, both hardware and software in the Government Higher Secondary Schools?

ii) What is the level of competence of teachers in the district in terms of use of ICT?

iii) Is there a need for any reform measures or intervention in providing ICT infrastructure and capacity building of teachers in the Government Higher Secondary Schools?

Objectives of the Study

The present research work was constructed with the following objectives.

i) To explore the availability of ICT infrastructures in Government Higher Secondary Schools.

ii) To analyse the ability of teachers in the use of ICT in the teaching learning process.

iii) To find out the need for interventions or reform measures in providing ICT infrastructures and the need for capacity building workshops for the teachers.

Review of Related Studies

Review of related literatures were organised under two headings, such as Government policies on the subject and related issues, and studies conducted in the field.

Government Policies on Subject and Related Issues: –

Policy on Open Application Programme Interference (APIs), 2015:

The Government of India is implementing the digital India Programme as an umbrella programme to prepare India for knowledge based transformation into a digitally empowered society and knowledge economy. Under the over-arching vision of Digital India, Government of India aims to make all Government services digitally accessible to citizens through multiple channels, such as web, mobile, and common service delivery outlet. To meet this obstacle, there is a need for an inter-operable echo system of data, applications and processes which will make the right information available to the right user at the right time.

The National Policy on ICT in School Education, 2012 aims at preparing youth to participate actively in the establishment, sustenance and growth of the knowledge society leading to all round socio-economic development of the nation and global competeness. Its ambition is to device, support and sustains ICT and ICT enabled activities and processes in order to improve access, quality and efficiency in the school system. The policy enjoins that programme of ICT literacy will be implemented all Secondary Schools in the state, both government and private within the XII Plan Period and ICT literacy programmes will be extended to the Upper Primary stage by the end of the XII Plan Period. *The National Cyber Security Policy, 2013* has its objectives to protect information and infrastructure in cyber space, build capabilities to prevent and respond to cyber threat, reduce vulnerabilities and minimise damage from cyber incidents, implementation of ICT in school education in the right perspectives, with proper knowledge about sharing, data accessibility, inter-operability, and cyber security will go a long way in reducing the present day menace of digital divide, and for preparing for students and teachers for transformation into a digitally empowered society and knowledge economy. "Guide for implementation of the ICT schools schemes and Model Bid Document", issues by Department of Education, Government of India, (2000) provides technical guideline to develop various components of the schemes on establishment of infrastructure like electricity, internet and telephone, fire safety, furniture,

computer hardware and software digital devices and digital content, provision of a Computer Teacher, building of capacities in ICT and school automation. In the Annual Administrative Report 2016-2017, the State Council of Educational Research Training (SCERT), Government of Manipur has mention about an innovative projects professional development of teacher educator in the use of technology in the class room under which classroom has been set up with technological aide with modern technological aids in DIET Centre of Kakching District in Manipur to train teacher educators and future educators to enhance their professional skills in the use of new technological aids as tools in teaching learning process.

Studies Conducted in the Field

Aristovnik (2012), studied on the impact of ICT educational performance and its efficiency in 27 selected European Union (EU) and Organisation for Economic Cooperation and Development (OECD) countries. The study confirmed that efficiency of ICT when taking educational outputs/outcomes into consideration differs significantly across the great majority of EU and OECD countries. The study suggested for significant provision for ICT expenditure in order to improve their education outputs and outcomes. Prasad et.al (2015), on this study teacher's perception of barriers to using ICT in Secondary School in India, found that lack of funding, lack of ICT integration and lack of connectivity were the most critical barriers to the use of ICT in the Secondary Schools. Lack of infrastructure and poor skilled personnel were the most important findings in the study. Byker (2014) conducted a literature review to examine the barriers to ICT and the possibilities for ICT in elementary schools in India. The finding includes lack of computers in classrooms, ICT resources are shared among students. There were no researchers about the Indian teachers and students assigned to computer technology. Meenakshi (2013), in her seminal paper, indicated that in terms of using internet and other ICT as a resource for lesson preparation, majority of the teachers interviewed admitted to never or rarely using it, while only few used to gather information sporadically or regularly. ICT was used in the classes, as an information source and not as a part of the core learning process. Thomas Johnsons (2014), in his studies revealed that students are interested to use ICT on when there are enough technology and teachers are an expert on the application of ICT. According to the findings, every student is not benefited by ICT though some are more benefited. Some even preferred the traditional methods of teaching.

Methodology

The present research study was designed to assess the status of ICT infrastructure and the ability of the teachers in the Government Higher Secondary Schools. In-depth analysis has been conducted on the conditions of the ICT infrastructures available in each of the schools and extent of the ability of the teachers in using ICT infrastructures. The study was conducted under two divisions: i) School ICT Infrastructure, ii) ICT Capacity of Teachers.

i). **School ICT Infrastructure:** this section of the study focuses on the following points:

a) Enabling infrastructure: it was to explore whether ICT enabling infrastructure is available in the schools in terms of electricity power connection, generator back-up, UPS back-up, and reliability of power supply for efficient functioning of the computer system.

b) Hardware infrastructure: it consist of the availability of the ICT infrastructure in terms of number of desktops, digital projectors, printers, scanners, landline and mobile phones, fax machine, cable TV, digital camera, and EDUSAT terminal in the school, and also to ascertain the location of the computers such as computer laboratory, classroom, teachers' lounge, administration, and library. Software: this was to confirm operating software used in the school computer system such as Microsoft, Linux, open source software, combination of these or any other software.

c) Networking Environment: it consists of networking environment in terms of number of computers connected to network, availability of email and school website, and extent of teachers access to internet in the school.

d) Use of ICT in School Education: the use of school computers and related technologies in classroom teaching in different subjects like separate ICT course, Mathematics, Sciences, Social Science, Local Language, English, Arts, Music, etc.

e) School ICT Unit: it was to ascertain whether the school has an ICT unit, a qualified ICT Coordinator or teacher, school budget for ICT and whether the school collect computer fee from students.

f) ICT Used for Other Purpose: it was to find out if the school ICT facilities are used for any other school activities, other than teaching learning, like school administration, school data base, evaluation, library, and for any other activity.

g) Evaluation: by consulting the Headmaster of the school, the overall status of use of ICT in teaching learning process in the school under the five parameters, namely: poor, fair, good, very good and excellent was rated.

ii). **ICT Capacity of Teachers:** This part of the analysis concentrated on the following given points:

a)   The Teachers' Educational Qualification, ICT qualification if any, if any teacher had completed on any ICT training or course given by the Government sponsored ICT training programmes.

b)   The stage of ICT competence of teachers, their ownership of computers, extent of use of computers in school work, teaching learning process, and use of email was analysed.

c)   ICT integration in teaching learning in the form of audio, visual, and audio-visual .Analysis on the use of ICT was made on the basis of four categories such as: informative tools, situation tools, learning process in the classroom, and communication tools.

Population of the Study

Teachers of Government Higher Secondary Schools constituted the population of the study.

Sample of the Study

The sample of the study consists of 10 (ten) teachers each form the Higher Secondary Schools of the study area, i.e., 70 (seventy) teachers represent as sample of the study.

Research Tools

Descriptive Survey Design was adopted in this study. Data was collected by using two separate questionnaires, i.e., for Teachers and Headmasters. The research work was conducted during the pandemic of Covid-19; therefore online mode of data collection was adopted.

Data Analysis

The collected data and information are presented in the form of tables and diagrams by using Statistical Package of Social Science (SPSS) indicating with frequency and percentage to facilitate the information regarding the availability of ICT infrastructures and ability of teacher in ICT. The analysed data are presented using simple percentage and are presented in the form of pie chart and histogram.   Analysis and interpretation of data was conducted under two approaches: i) Availability and Status of ICT Infrastructure, ii) Ability of Teachers in the use of ICT in the Teaching Learning Process.

i) **Availability and Status of ICT Infrastructure:** There is a growing need for ICT infrastructure in the Government Higher Secondary Schools of Churachandpur District. Among the 7 (seven) schools of the investigation only 3 (three) schools has computers whereas the rest of the schools are using laptops that belongs to the school Headmasters. As reported by the Headmasters of the schools, the state Government had provided computers in the past few years, but due to irregular electricity supply and low quality, the computers are not useable. Table No. 1 below shows the frequency and percentage of infrastructure of the Secondary schools.

Table 1. Availability of ICT Infrastructure

Variables	Frequency	Percentage
Digital projector	1	14
Printer	2	28
Scanner	3	42
Laptop	4	57
Desktop	3	42
Photocopier	0	0
Camera	4	57

The above table reveals the availability of terms of digital projector, printer, scanner, laptop, desktop, photo copier and camera.
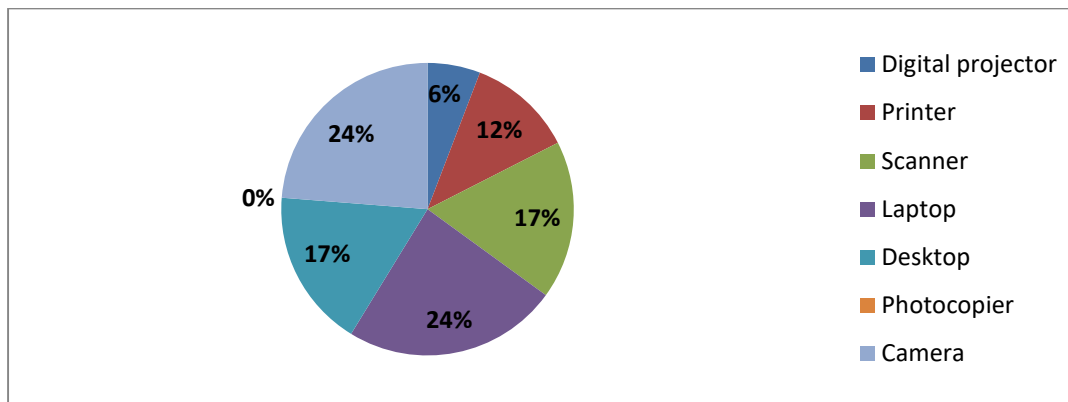
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Figure 1. Pie-chart showing ICT infrastructure availability in Government Higher Secondary Schools in Churachandpur District of Manipur.

Table 2. Frequency and percentage distribution of ICT infrastructure of Government Higher Secondary Schools

| Variables	Categories	Frequency	Percentage
	Not connected	7	100%
Internet at school	Dial up	0	0%
	Wireless	4	57%
	Broad band	1	14%
Email at school	Having email ID	4	57%
	Not having email ID	3	42%
School web-site	Having a web-site	6	85%
	Microsoft	7	100%
Operating soft ware	Linux	0	0%
	Open source software	0	0%
	Single phase electricity	7	100%
Enabling infrastructure	Generator back up	2	28%
	UPS back up	3	42%
	Having ICT unit	0	0%
School ICT Unit	Having ICT Coordinator	0	0%
	Not having ICT Teacher	4	57%

The above Table No. 2 shows all the Higher Secondary Schools in Churachandpur District has internet connection through wireless and broadband. Communication is done through email. However, no school has ICT Coordinator and ICT teacher, therefore, the schools has low ICT infrastructure status.

i) **Ability of Teachers in the use of ICT in the Teaching Learning Process:** The result of the analysis on the efficiency or capacity of the teachers in the use of ICT reveals that, out of 70 teachers, 14 percent of teachers are excellent in the use of ICT and 7 percent of teachers are not capable of using ICT, shown in figure 2.

Table 3. Ability of Teachers in the use of ICT

Category	No. of Teachers	Percentage
Excellent	10	14%
Very good	20	28%
Good	10	14%
Fair	25	35%
No capacity	5	7%
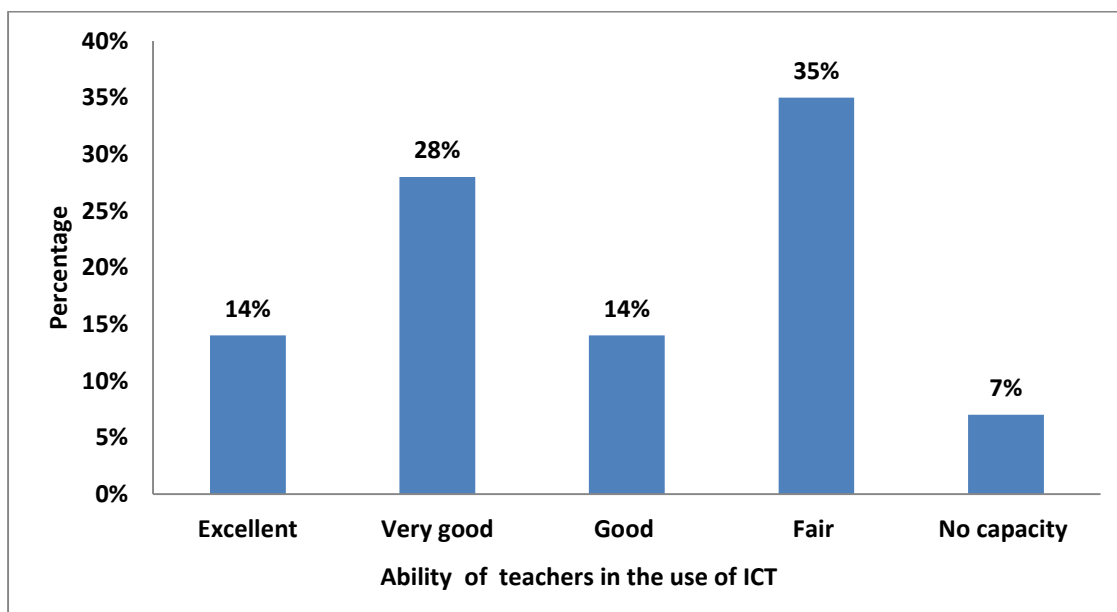
Figure 2, Bar Diagram showing ICT capability of teachers in the Higher Secondary Schools.
Table No. 4 shows the degree of ICT integration by teachers in school work by using various ICT tools under four categories of purpose. ICT tools are very often used for informative purpose by

14% of teachers, twice or more by 35%, sometimes by 14% and rarely by 28%. For functional purposes, ICT tools are never used by 14% of teachers, sometimes by 35%, every day by 7%, and twice or more by 35% of teachers. For creating purpose, these tools are never used by 50% of teachers, rarely by 35% and sometimes by 35%. For communication purpose, ICT tools are used every day by 14% of teachers, twice or more by 28%, sometimes by 35% hardly by 14% and never used by 7% of teachers. Teachers commonly used their own computers while preparing lesson plans, downloading of reading material, communication and other teaching related activities.

Table 4. Frequency and percentage distribution of ICT integration in school activities by the teachers of Government Higher Secondary Schools

Purpose for the use of ICT Tools	Category	Frequency	Percentage
Informative: to find, acquire and use information	Everyday	10	14%
	Twice or more a week	25	35%
	Sometimes	10	14%
	Rarely	20	28%
	Not at all	5	7%
Functional or situating: prepare homework, compare information, etc.	Everyday	5	7%
	Twice or more a week	25	35%
	Sometimes	25	35%
	Rarely	5	7%
	Not at all	10	14%
Creating or Constructive: to compose, compile new information, make PowerPoint presentation, etc.	Everyday	0	0%
	Twice or more a week	0	0%
	Sometimes	25	35%
	Rarely	25	35%
	Not at all	35	50%
Communication: to exchange and transmit information using Email and internet, joint discussion forum, chats, etc.	Everyday	10	14%
	Twice or more a week	20	28%
	Sometimes	25	35%
	Rarely	10	14%
	Not at all	5	7%

Use of ICT Tools in Teaching Learning by Teachers of Government Higher Secondary Schools

The study found that the intensity of using ICT tools in teaching learning by teachers is high though it is hardly used in the classroom teaching learning process. This may be due to lack of installation of ICT infrastructures in the schools. Teachers used their personal computers at home to conduct the purposes.

Competence of Teachers in ICT

The Higher Secondary teachers were introduced to ICT according to the level of exposure to computers experience at the school or college level. According to the study, 36% of the teachers in Higher Secondary do not have any ICT competence, 42% have acquired the basic stage of ICT competence, 14% has acquired intermediate stage and only 7% in the advance stage of ICT competence. There is absolute necessity for capacity building of teachers in the use of ICT in education in the district. The analysis of the present study revealed lack of basic resources in the form of infrastructure both hardware and software in the Government Higher Secondary Schools, lack of teacher preparation, lack of research and understanding of how ICT technology is negotiated in the classroom as barriers to implementation of ICT library in the schools.

Conclusion

In the light of the research findings, the researcher stressed that there is a growing need for ICT infrastructures, particularly with digital projector, printer, scanner, photo-copier, internet and enabling infrastructures such as single phase electricity, generator back-up, UPS back-up,etc., with ICT unit and Coordinator. Even though majority of the teachers are capable of using computers or digitally literate, due to lack of infrastructures the policies driven by the Government of India to strengthen ICT and the reality in the hill districts of Manipur seems to be poles apart. This gap could be bridged only when the policy implementing agencies are aware of the facts and thereby providing quality infrastructures, capacity building workshops for the teachers. In short, the policy to equip schools, teachers, and students digitally and the efforts for Digital India could be materialised only when there is efficient ICT infrastructures and Government sponsored ICT training programmes are effectively provided to the teachers. This will also enhance the core value of India's New Education Policy, 2020.

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