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UNDERSTANDING AND ENHANCING ICT IN SCHOOL EDUCATION

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ABSTRACT

Information and communication technology (ICT) today has pervaded almost every sphere of human life, and looks set to conquer a whole new frontier, the education field. ICT act as a perfect motivating tool. ICT as a more comprehensive umbrella that implies convergence and hybridization of technology is a recent development in Indian education. The students can receive a high quality education through Information and communication technology by providing teachers with high-quality professional development and support.

Children's early experiences with ICT and other media will impact on their development, and their experiences of childhood. It supports children's cognitive and emotional development and the development of social and co-operative skills. So now a strong focus should be needed on the development of ICT policy, and interaction of ICT in curriculum and practice across the whole education sector. This will lead to enable the future generation to have access to the skills for coping with and the ability to function effectively in this age of information and knowledge. The ICT unit would have the responsibility of implementing the goals and objectives of the national educational strategic and Action plan. Moreover, I consider that the use of ICT development reflection, collaboration and autonomy amongst learners which also would lead to quality in education and continuous self-development. The purpose of this paper is to know the use of ICT in various school education of India, national goal for ICT and integration of ICT in School Education.

Key Words: Information and communication technology, Technology, School Education

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I. Introduction

***ICT is "A diverse set of technologies, tools and resources used to communicate, create, disseminate, store and manage information"*- Dr. Craig Blurton**

In this 21st century ICT is a crying need to sustain a high growth rate of our economy through capacity building and knowledge empowerment of the people and for promoting new, upcoming multi-disciplinary fields of knowledge. Advances in information technology and communication are transforming the world education and presenting new challenges to all countries. The challenge for developing nations is to complete effective in emerging information -based knowledge. The forms of technology that are used to transmit, store, create, display, share or interchange information by electronic means termed as Information and Communication Technologies (ICT). ICT includes such technologies as radio, television, video, DVD, telephone (both land line and mobile phones), Satellite systems, computer and network, hardware and software, as well as videoconferencing, e-mail and blogs also associated with it.

In the recent years there has been a groundswell of interest in how ICT has been deployed in the teaching- learning sector. One of the most vital contributions of ICT in the field of education is easy access to learning resources. With the help of ICT, students can now browse through e-book, sample examination papers, previous year papers etc. and can also reach simply at resource persons, mentors, experts, researchers, professionals and peers-all over the world within a second. ICT proposed in 11th plan period like – There has been a significant impact of ICT in the delivery of educational services across the world. ICT infrastructure will be established at government and government-aided secondary and senior secondary schools during the eleventh plan period. An amount of 5000 crore is being provided during the 11th plan for providing ICT infrastructure in schools. Under this programme, each school will be provided

with ICT infrastructure consisted of a networked computer lab, at least ten computers, a server, a printer connected on LAN, Broadband Internet connectivity up to 2 mbps, a Smart classroom, audio-visual equipment, Education content and CDs and trained teachers having the knowledge of computer

ICT is not just an instructional tool, but the backbone of the information society, which touches upon almost every aspect of private and professional life just like reading and writing are traditional competencies transmitted through education, the effective use of ICT for learning, communication and co-operation is one of the basic competencies which schools need to take care for.

ICT provides reliable information and construction of knowledge by any individual. In addition, ICT can universalize education in the truest sense. To extract the National Curriculum Framework (NCF) 2005, "ICT is an important tool for bridging social divides. ICT should be used in such a way that it becomes an opportunity equalizer by providing information, communication and computing resources in remote areas". The study focuses on present status of use of ICT in various school education of India, national goal for ICT and how to Integrate ICT in School Education.

II. Related Literature

Sar and Misra (2019) The study evaluated the ICT policy and assesses its implementation at school level in terms of effectiveness towards mass education of the state of Odisha. It suggested, Broadband connectivity may be provided to more numbers of schools where it is feasible. The e Content questions should be provided in hard copies for practice of students at their home. A full-time regular computer teacher should be appointed in every school running e Content courses [10]. Saravanakumar (2018) suggested that ICT is adoptable for every situation in the classroom environment to creating the motivation among the learners. It merged as an important part in the field of education at present and near features [11]. Patil (2017) Findings reveal that there a scarcity of broad band Internet service in majority of government schools in Satara district, teachers are not well trained and updated with recent software and its uses. The existing curriculum also needs industry link modification and application based teaching that will help in enhancing the quality education in public as well as in private sector schools of Satara

district [9]. Meenakshi (2013) identified that many teachers are reluctant to use ICTs, especially computers and the internet. They felt that if trained, they would be in a position to make use of resources available in the school. Support of school administrators and, in some cases, the community, is critical if ICTs are to be used effectively [7]. Bhasin (2012) emphasized ICT integration is a comprehensive process of applying technology to the educational system to improve teaching and learning. She also noted that ICTs should be used currently in conjunction with well planned classroom teaching [1]. Devi, Rizwaan and Chander (2012) stated that Quality in education through ICT and its awareness among stakeholders will have positive impact on the society. ICT can be employed in formal and Non-formal types of education and would eventually make the learners employable and socially useful part of the society [3]. Sure (2010) found that B.Ed. colleges affiliated to University of Mysore have moderate e-maturity. The institutions have better e-learning resources; its integration across curriculum was poor. Teacher educators have average computer knowledge, are perceived to have high levels of computer skills, and have highly positive attitude towards computer use [12].

III. ICT in Indian School Education

ICT education in schools has been influenced by the rapid development of ICT literacy of all individual. ICT knowledge entails a facility with ICT and is considered to be a key concept in life- long learning. Implicit in the goal of ICT knowledge as a continued initiative in education in the realization of the potential of ICT for better learning. Today's generations of students are "digital natives" (Prensky, 2001) born into a world run by technology, their comfort level with technology is indisputable.

Over the past few decades, technology has completely transformed our lives in all possible ways. India, an effective ICT powered nation, has always laid a lot of stress on the use of ICT, not only for good governance but also in divers sectors such as economy, health, agriculture and education etc. In India, many programmes and schemes such as Free and Compulsory Education, 'Education for all' movement (Sarva Shiksha Abhiyan), National Literacy mission etc. have been launched by government to improve the education system. While the NCF has acknowledged that educational technology and ICT are significant tools to achieve constructive learning in the new generation of Indian classroom, it admits to a lack of detailed curricular ideas of how technology could or should fit in.

IV. Technologies that are included in ICT

Animation
Community Radio
Computers
Desktops
Digital Board
Digital Camera
Digital Pad
Digital Stories
Digital Video Camera
Fax Machine
FM Radio
Information Kiosks
Interactive Radio
Interactive TV
Interactive Voice Recognition System
Internet
Internet Recorder
Internet Telephony
Internet Protocol Television
i-Pod
i-Lab
Laptops
LCD Projector
Local Area Network
Mobile
Movie Telephone
Notebook
Net book
Network Components
Online Learning
Personal Computer
Personal Digital Assistance
Podcasting
Portals
Printers
Radio
Television (DTH)
Video
Video Camera
Voice Recorder
Web
Wide Area Networks
Wi-Fi
Wi Ki
Wireless

V. Report of Unified District Information System for Education Plus, 2018-19

Table: 1 Number of schools by management and availability of computer facility in India, 2018-19

States of India	% of Schools with computer facility				
	All management	Govt.	Govt.aided	Pvt. unaided	Others
Andaman and Nicobar Islands	52.17	43.07	100	93.06	100
Andhra Pradesh	28.88	14.92	7.97	72.06	9.75
Arunachal Pradesh	15.37	10.98	40.63	38.37	31.91
Assam	13.93	13.67	5.78	38.92	1.52
Bihar	10.99	5.58	14.47	39.72	32.84
Chandigarh	98.25	98.35	100	100	92.59
Chhattisgarh	93.12	98.2	38.25	63.72	25.38
Dadra and Nagar Haveli	72.83	71.33	60	88.57	100
Daman and Diu	92.86	92.86	100	91.3	100
Delhi	92.41	93.79	84.58	91.71	0
Goa	48.79	17.53	87.94	91.37	0
Gujarat	70.25	66.06	84.58	75.03	50

Haryana	47.9	31.7	73.08	75.81	60.52
Himachal Pradesh	32.48	22.94	0	85.46	0
Jammu and Kashmir	21.45	12.92	100	57.58	42.55
Jharkhand	56.13	62.71	21.58	50.79	30.54
Karnataka	92.02	91.13	93.81	93.52	100
Kerala	87.91	90.4	91.58	82.22	72.29
Ladakh	28.94	25.41	25	58.41	0
Lakshadweep	91.11	91.11	0	0	0
Madhya Pradesh	6.56	3.66	8.24	18.88	2.97
Maharashtra	69.75	60.21	82.29	86.63	77.38
Manipur	27.48	13.24	6.47	78.36	55.25
Meghalaya	12.24	8.04	15.83	18.78	19.31
Mizoram	46.64	37.32	75.76	62.34	58.06
Nagaland	39.79	29.7	0	66.98	0
Odisha	9.84	11.87	1.99	0.32	1.91
Puducherry	89.17	91.73	78.79	86.57	0
Punjab	62.8	52.5	81.66	84.76	79.64
Rajasthan	44.34	30.67	0	71.51	25.08
Sikkim	57.05	51.41	52.63	68.82	0
Tamil Nadu	50.81	47.78	33.73	71.27	54.92
Telangana	32.73	21.89	29.84	61	17.07
Tripura	14.22	10.42	54.35	54.81	16.6
Uttar Pradesh	12.48	3.75	37.45	26.66	11.3
Uttarakhand	33.45	22.35	57.14	64.07	42.45
West Bengal	11.51	11.21	34.65	11.46	18.9

Source: UDISE+ 2018-19

It was found from Table-1:

A minimum of 6.56% (Madhya Pradesh) and maximum of 98.25% (Chandigarh) Schools with computer facility in all management. A minimum of 3.66% (Madhya Pradesh) and maximum of 98.35% (Chandigarh) Schools with computer facility in Govt. school. A minimum of 1.99% (Odisha) and maximum of 100% (Andaman and Nicobar Islands, Chandigarh, Daman and Diu and Jammu and Kashmir) Schools with computer facility in Govt. aided school and no computer facility was found in Himachal Pradesh, Lakshadweep, Nagaland and Rajasthan. A minimum of 0.32% (Odisha) and maximum of 100 % (Chandigarh) Schools with computer facility in Pvt. unaided school and no computer facility was found in Lakshadweep. A minimum of 1.52% (Assam) and maximum of 100% (Andaman and Nicobar Islands, Dadra and Nagar Haveli, Daman and Diu and Karnataka) Schools with computer facility in others school and no computer facility was found in Delhi, Goa, Himachal Pradesh, Ladakh, Lakshadweep, Nagaland, Puducherry and Sikkim.

Table: 2 Number of schools by management and availability of functional computer facility in India, 2018-19

States of India	% of Schools with functional computer facility				
	All management	Govt.	Govt.aided	Pvt. unaided	Others
Andaman and Nicobar Islands	50.48	41.3	100	91.67	100
Andhra Pradesh	28.88	14.92	7.97	72.06	9.75
Arunachal Pradesh	14.76	10.41	40.63	37.38	31.91
Assam	12.23	11.45	5.53	37.97	1.46
Bihar	10.71	5.4	14.04	38.97	32.13
Chandigarh	98.25	98.35	100	100	92.59
Chhattisgarh	92.95	98.18	36.41	62.67	24.16
Dadra and Nagar Haveli	71.1	69.33	60	88.57	100
Daman and Diu	90.71	91.96	100	82.61	100
Delhi	91.48	92.24	84.19	91.37	0
Goa	47.98	16.45	87.55	90.65	0
Gujarat	68.61	64.57	83.38	72.82	50
Haryana	46.73	30.06	73.08	75.39	60.06
Himachal Pradesh	31.68	22.25	0	84.09	0
Jammu and Kashmir	21.13	12.56	100	57.46	42.55
Jharkhand	55.59	62.1	21.24	50.64	30.3
Karnataka	92.02	91.13	93.81	93.52	100
Kerala	86.1	88.72	88.84	81.75	71.77
Ladakh	28.56	24.97	25	58.41	0
Lakshadweep	91.11	91.11	0	0	0
Madhya Pradesh	6.38	3.51	8.01	18.54	2.92
Maharashtra	66.97	56.54	80.92	85.19	74.35
Manipur	26.01	11.29	5.79	77.87	54.14
Meghalaya	11.88	7.73	15.47	18.2	18.88
Mizoram	45.36	35.84	73.59	61.66	58.06
Nagaland	38.48	28.2	0	66.17	0
Odisha	9.84	11.87	1.99	0.32	1.91
Puducherry	86.47	87	78.79	86.57	0
Punjab	53.72	40.31	79.69	82.15	77.5
Rajasthan	41.86	29.37	0	66.96	20.56
Sikkim	55.74	50	52.63	67.63	0
Tamil Nadu	49.12	45.38	33.29	70.8	54.6
Telangana	31.94	21.19	29	59.95	17.07
Tripura	13.59	9.93	52.17	53.06	15.38
Uttar Pradesh	11.94	3.38	36.46	25.84	10.71
Uttarakhand	31.4	20.02	56.01	62.76	40.61
West Bengal	11.07	10.86	30.71	10.48	18.21

Source: UDISE+ 2018-19

It was found from table: 2

A minimum of 6.38% (Madhya Pradesh) and maximum of 98.25% (Chandigarh) Schools with functional computer facility in all management. A minimum of 3.38% (Uttar Pradesh) and

maximum of 98.35% (Chandigarh) Schools with functional computer facility in Govt. school. A minimum of 1.99 % (Odisha) and maximum of 100% (Andaman and Nicobar Islands, Chandigarh, Daman and Diu and Jammu and Kashmir) Schools with functional computer facility in Govt. aided school and no computer facility was found in Himachal Pradesh, Lakshadweep, Nagaland and Rajasthan. A minimum of 0.32% (Odisha) and maximum of 100% (Chandigarh) Schools with functional computer facility in Pvt. unaided school and no computer facility was found in Lakshadweep. A minimum of 1.46% (Assam) and maximum of 100% (Andaman and Nicobar Islands, Dadra and Nagar Haveli and Daman and Diu and Karnataka) Schools with functional computer facility in others school and no functional computer facility was found in Delhi, Goa, Himachal Pradesh, Ladakh, Lakshadweep, Nagaland, Puducherry and Sikkim.

Table: 3 Number of schools by management and availability of internet facility in India, 2018-19

States of India	% of Schools with internet facility available				
	All management	Govt.	Govt.aided	Pvt. unaided	Others
Andaman and Nicobar Islands	25.85	19.17	100	55.56	0
Andhra Pradesh	17.22	8.17	8.53	44.28	13.75
Arunachal Pradesh	7.17	3.46	35.94	26.04	17.02
Assam	5.52	4.22	2.57	23.98	0.98
Bihar	6.71	2.05	4.15	33.78	24.51
Chandigarh	96.94	100	100	100	74.07
Chhattisgarh	5.47	1.71	15.21	31.54	6.12
Dadra and Nagar Haveli	21.68	13.33	40	85.71	100
Daman and Diu	72.86	68.75	75	91.3	100
Delhi	82.31	84.59	79.45	80.2	0
Goa	40.44	10.2	79.18	78.42	0
Gujarat	66.6	61.89	68.14	78.1	75
Haryana	41.24	20.34	73.08	77.88	52.83
Himachal Pradesh	21.62	13.34	0	67.64	0
Jammu and Kashmir	12.26	6.13	0	38.35	12.77
Jharkhand	29.58	27.79	14.53	58.93	35.15
Karnataka	11.82	2.2	13.78	34.54	14.29
Kerala	87.62	88.53	91.05	87.83	65.27
Ladakh	5.41	2.41	3.57	30.09	0
Lakshadweep	84.44	84.44	0	0	0
Madhya Pradesh	11.28	3.31	24.94	44.01	14.45
Maharashtra	34.45	10.5	62.51	80.3	66.49
Manipur	13.36	2.28	1.36	50.85	32.6
Meghalaya	3.75	1.46	5.6	7.79	6.22
Mizoram	6.95	2.46	15.58	15.51	15.05
Nagaland	15.04	3.04	0	47.38	0
Odisha	6.26	7.54	1.77	0.26	0
Puducherry	66.58	46.81	93.94	92.93	0
Punjab	46.45	31.73	74.02	77.79	71.07

Rajasthan	30.2	16.58	0	57.7	5.16
Sikkim	18.68	12.53	26.32	30.94	0
Tamil Nadu	23.81	10.1	21.92	65.63	43.81
Telangana	18.31	7.13	22.91	46.92	7.32
Tripura	3.42	1.58	26.09	21.87	5.67
Uttar Pradesh	10.89	3.31	24.47	23.84	10.47
Uttarakhand	15.55	5.81	31.33	42.94	23.67
West Bengal	6.9	6.96	24.41	5.27	10.86

Source: UDISE+ 2018-19

It was found from table-3:

A minimum of 3.42% (Tripura) and maximum of 96.94% (Chandigarh) schools with availability of internet facility in all management. A minimum of 1.46% (Meghalaya) and maximum of 100% (Chandigarh) schools with availability of internet facility in Govt. school. A minimum of 1.36 % (Manipur) and maximum of 100% (Andaman and Nicobar Islands and Chandigarh) schools with availability of internet facility in Govt. aided school and no internet facility was found in Himachal Pradesh, Jammu and Kashmir, Lakshadweep, Nagaland and Rajasthan. A minimum of 0.26% (Odisha) and maximum of 100% (Chandigarh) schools with availability of internet facility in Pvt. unaided school and no internet facility was found in Lakshadweep. A minimum of 0.98% (Assam) and maximum of 100% (Dadra and Nagar Haveli and Daman and Diu) schools with availability of internet facility in others school and no internet facility was found in Andaman and Nicobar Islands, Delhi, Goa, Himachal Pradesh, Ladakh, Lakshadweep, Nagaland, Odisha, Puducherry and Sikkim.

VI. National Goal for ICT in Education

The Information and Communication Technology (ICT) in Schools was launched in December 2004 and revised in 2010 to provide opportunities to secondary stage students to mainly build their capacity on ICT skills and make them learn through computer aided learning process. In the light of the relevance and importance of adopting information and communication technology in the education sector, the National strategy and Action plan for ICT in education should have following five goals.

G_1) All students and teachers will have access to information and communication technology in their classrooms, schools, communities and home.

G_2) All teachers will use technology effectively to help students achieve high academic standards.

G_3) All students will have technology and information literacy skills.

G_4) Research and evaluation will improve the next generation technology applications and learning.

G_5) Digital content and networked applications will transform teaching and learning.

VII. Integration of ICT in School Education Curriculum

ICT literacy means harnessing technology to perform learning skills such as communicating effectively with presentation software or juggling personal responsibilities with a personal digital assistant. Developing ICT Knowledge requires good leadership, a strong technology infrastructure, adequate and equitable access to technology and internet in schools, integration of technology with class room learning and adequate methods for accessing ICT literacy. ICT should be integrated in to the schools to meet the curricular goal. Effective integration of ICT in school must consider integration issues into both the curriculum and assessment. When ICT is set up into the assessment process, there is a need to reconsider the assessment approaches. There may be a greater role for formatting assessment when ICT is integrated into the assessment process. It is already clear that in the longer term the key contribution that ICT can make to such reform is its ability to:

- Motivate pupils.
- Encourage autonomous learning.
- Facilitate differentiated learning experiences.
- Allow the curriculum to be tailored to the needs of individual pupils.
- Broaden the range of sources and resources available.
- Provide improved feedback on learning outcomes.

The core curriculum of each school address the use of technology as an integral part of student learning in each content area, including specific technology knowledge and skills needed by students. For example:

- Word processor and e-mail -promote communication skill
- Modeling software -promotes the understanding of science and math concepts.
- Database and spreadsheet programmes-organizational skills
- CD- ROMs and the Internet- Inquiry skills.

As per the International Society for Technology in Education (ISTE) NETS Standards.

Technology standard for all students

- Basic operation and concepts
- Social , ethical and human issues
- Technology productivity tools
- Technology research tools
- Technology problem solving and decision-making tools.

Technology standard for All Teachers

- ✓ Technology operations and concepts
- ✓ Planning and designing learning environments and experiences
- ✓ Teaching, learning and the curriculum
- ✓ Assessment and evaluation
- ✓ Productivity and professional practice
- ✓ Social, ethical, legal and human issues

Technology standard for Administrators

- Leadership and vision
- Learning and teaching
- Productivity and professional practice
- Support management and operations
- Assessment and evaluation
- Social, legal and ethical issues

VIII. Conclusion

Knowledge and information is now widely accepted as a new form of wealth, a driving force for the development of individuals, communications and nations. The challenge therefore, is to enable the population in general to have access to the skills for coping with and the ability to function effectively in this age of information and knowledge, empowering them thereby with improved life-chance and quality of life in a global world. ICT create a new learning environment by using ICT tools and transform the pedagogical practice to become more interactive and process based so that students acquired the technical, methodological and social competencies spelt out in the NCF 2005. ICT has tremendous potentiality. It utilized for the benefit of students and teachers. ICT is an effective tool in the hand of the teachers for teaching and student for learning. Hence the school initials task is to develop a clear set of goals, expectations and criteria for student learning based on national and state educational standards.

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