Scientific Journal of Impact Factor(SJIF): 4.14

e-ISSN(O): 2348-4470
p-ISSN(P): 2348-6406

International Journal of Advance Engineering and Research Development

Special Issue for ICPCDECT 2016,Volume 3 Issue 1

Analysis of ICT impact on Education

A Survey on Schools

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Abstract —*ICT Stands for "Information and Communication Technologies." It refers to technologies that offer access to data through telecommunications. It is a term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. To understand the current scenario of ICT on Education we conducted a survey on Internet from schools across 9 states of India. The survey was conducted with the help of Survey Monkeys, an online survey portal.*
Based on over 1000 responses from students, teachers and head Masters from 9 states collected and analysed during the school year 2014-15, the Survey of Schools: ICT in Education provides detailed, up-to-date and reliable benchmarking of Information and Communication Technologies in school level education across India, painting a picture of educational technology in schools: from infrastructure provision to use, confidence and attitudes.
The purpose of this paper is to understand the current scenario and factors related to policy, planning, technical requirements as well as the training required for the teachers for the successful implementation of ICT in an educational system

Keywords- *ICT, technology, communication, information, interactive learning.*

I. INTRODUCTION

Today in the modern world IT plays a phenomenal role in defining the prospects of individual, organization, society, country. Today one of the most influential and useful product is Mobile phone which brought world at our hands .It is because of using advanced technology in the mobile set. ICT revolutionized industry approach and also laid a platform for increasing the market share, acquiring technology, developing human resources, building competencies.
There are now between 35 and 45 students per computer on average in the India; laptops and net-books are becoming pervasive. About eight out of ten students in schools do not have broadband. Most schools are connected at least at basic level (indicated by having local area network, virtual learning environment). The Survey findings estimate that in India on average, only between 5 and 8% of students at Class 4 and 8, and around 15% of students at Class 11, are in highly equipped schools, i.e. with high equipment level, fast broadband (2 mbps or more) and high connectedness. The percentages of such schools differ enormously between states [1].
Even so, school heads and teachers consider that insufficient ICT equipment (especially interactive whiteboards and laptops) is the major obstacle to ICT use. Inhibitors like this are not the same across states and these national differences are analysed in this research paper.
Only 10% of students at class 8 and 10 in general education use a desktop or a laptop after or during lessons at school at least weekly, but around 80% of the students at the same grades never or almost never use a computer during lessons.
Interestingly, no overall relationship was found between high levels of infrastructure provision and student and teacher use, confidence and attitudes [2].

II. BACKGROUND STUDY

Where does all this data and analysis take us? What are the lines of action for everyone involved? The survey picks out some areas where those concerned – especially policy-makers at national, regional and school levels – should consider further steps.
In general terms, the survey findings make the case for **strengthening public action** at institutional, local, regional,-national levels, to boost ICT use at school so as to reduce the gap between ICT use in and out of school – a gap identified many years ago but still persistent in 2015 - and give greater opportunities to about 70% of 16-year-old students lacking adequate home access to ICT to experience it at school. Findings of this survey plead to orientate such public action preferably towards **building capacity for ICT pedagogical** expertise at school level. It also suggests investigating in more detail why digital learning resources are not used more, and ways to improve the situation, by increasing public/private partnerships with publishers, developing teachers' online communities for content creation and open content products, etc [3].
Evidence shows also that increasing **professional development opportunities for teachers** is efficient way of boosting

ICT use in teaching and learning, since it helps build highly confident and supportive teachers. This seems only sensible given that teachers' opinions about the impact of using ICT for learning purposes are already very positive and about 80% of students are in schools where the school head also shares such positive views.
States might be wise to ensure that ICT training – consistently specified and applied – is made a compulsory component of all initial teacher education program.
Despite having access and positive attitudes towards implementing ICT in teaching and learning, teachers often find this difficult and require **support – not only technical but also pedagogica**l. Increasing the training provided by school staff and others to teachers of all disciplines should therefore be encouraged, including subject-- specific training on learning applications. Online professional collaboration between teachers can also lead to effective changes in their practice, and a deeper awareness of their own professional development needs [4] [5].

III. RESEARCH FOCUS

The focus of the study is on developing indicators and gathering and analysing data on students' use, -competence, and attitudes to ICT. Teacher and school level factors were investigated as regards their impact on students. The main areas of investigation are:

A. Students' digital competence and attitudes towards ICT
B. Students' ICT use in /out of classroom
C. Teachers' professional ICT use in/out of classroom
D. Teachers' attitudes towards pedagogical ICT use
E. School infrastructure, connectivity and ICT access
F. School leadership in ICT and ICT for pedagogy

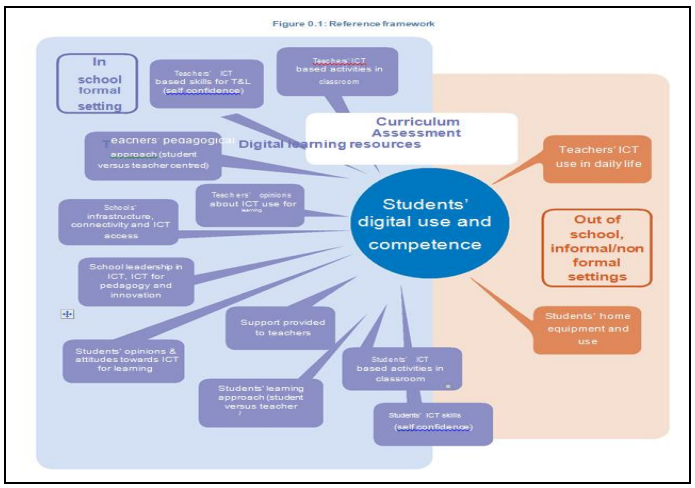


Figure0.1

This analytical framework has guided the survey's design in terms of scope and content, identifying the most important issues with a view to gathering data and providing both a descriptive state of the art about ICT in schools through a set of relevant indicators, as well as discussing some additional explanatory findings. The whole survey has been designed to answer to the research questions summarized in Figure0.1.

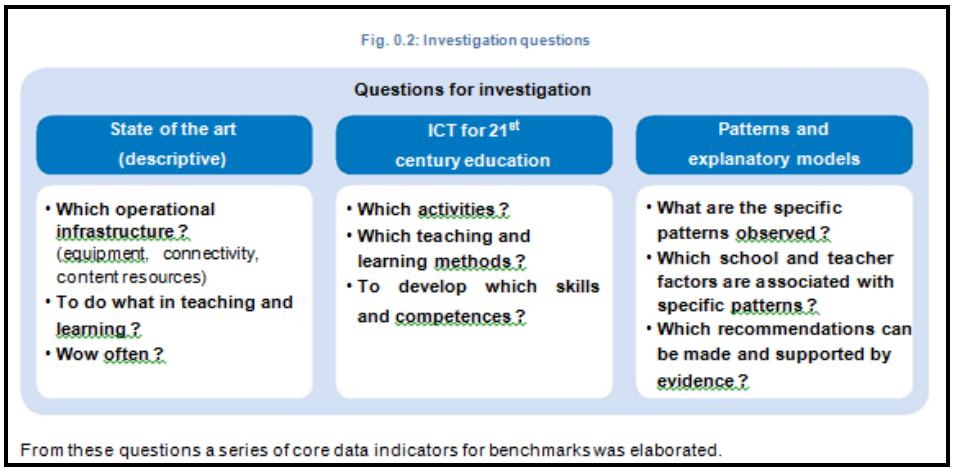


Figure0.2

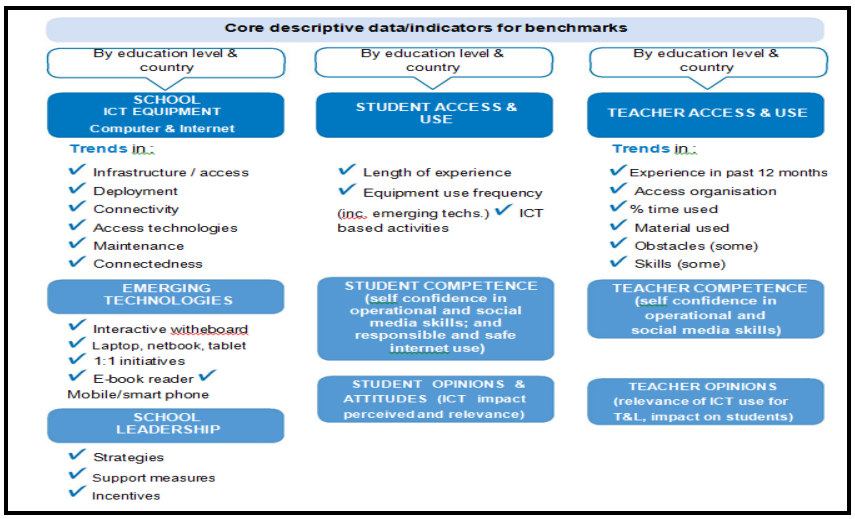


Figure0.3

IV. RESEARCH OBJECTIVES

From these questions a series of core data indicators for benchmarks was elaborated. Finally, an overall conceptual model was agreed to frame the explanatory part of the analysis. Using cluster analysis, some key relationships have been investigated, introducing the concepts of highly equipped school, digitally supportive school, digitally confident and supportive teacher and digitally confident and supportive student. The aim was to investigate through the data how each of these concepts could be -defined on the basis of the data analysis, that is:

A. How a digitally supportive school could be defined, looking at the school variables (in terms of policies, strategies, incentives, support measures such as the provision of an ICT coordinator and teacher -professional development, school heads' attitudes and obstacles) associated with higher frequency of ICT equipment use and ICT based activities, as well as higher competence levels (self-confidence) for students and teachers.
B. How a digitally confident and supportive teacher could be defined, looking at the variables (access to and use of ICT, professional development undertaken, obstacles, self-confidence, opinions and attitudes -towards ICT use in T&L) associated with teachers' higher frequency of ICT based activities for T&L.
C. How a digitally confident and supportive student could be defined, looking at a set of variables characterizing ICT activities at school and home (access, length of experience, frequency of ICT equipment use and ICT based activities).
D. How a digitally confident and supportive student could be defined, looking at a set of variables -characterizing.

ICT activities at school and home (access, length of experience, frequency of ICT equipment use and ICT based activities) [6][7].

V.METHODOLOGY

Target populations **-** This study collected data from schools (school head masters), classrooms (teachers), and students at level 1 (primary level of education), level 2 (secondary level of education) and level 3 (High School- level of education).

Table0.1

Class	level	Description	Average age
Class1-5	Level 1	Primary school	9.5
Class6-8	Level 2	Secondary	13.5
Class 10 (general)	Level 3	High School	16.5
Class 11	+2	Intermediate/ +1,+2	16.5

Participation **-** A participating school is defined as a school where at least one student, one teacher, or one principal has completed- a questionnaire. Table 0.1 shows levels of participation as percentages of the total number of sampled schools. Got great response from Schools from South India.

Table0.2

	Class 4	Class 6	Class 8	Class 10	Class 11-12
State	Schools participation	Schools participation	Schools participation	Schools participation	Schools participation
TamilNadu	23	23	23	23	12
Kerala	32	26	21	25	17
Andhra Pradesh	18	10	12	13	10
Maharastra	6	19	19	19	9
Karnataka	17	17	17	17	8
Gujrath	7	6	6	6	12
Jarkhand	2	8	8	8	2
West Bengal	15	15	15	15	3
Orissa	3	11	11	11	5

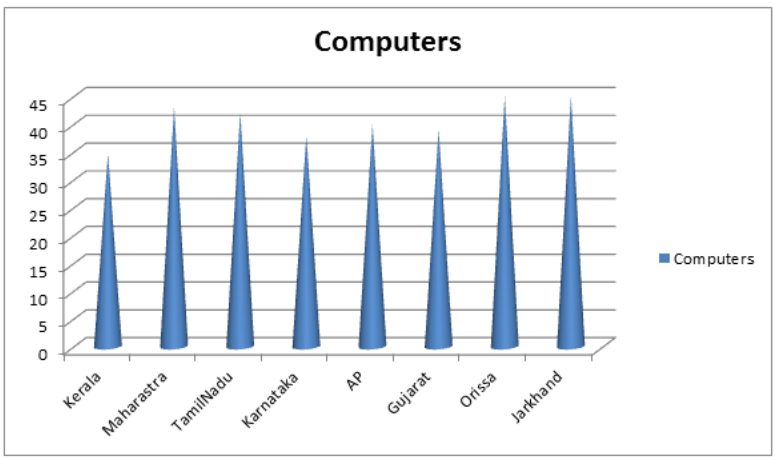
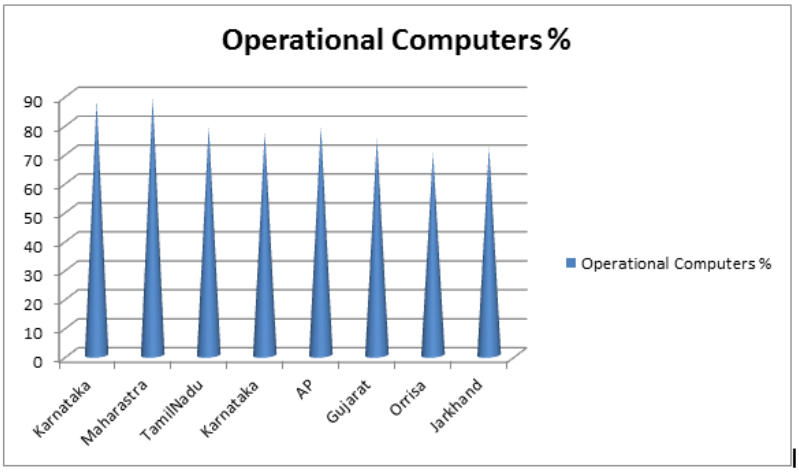


Figure0.4

The number of students per computer is between 35 to 45, which is very low. This reflects the national status. This can be considered as the mirror for the current status [8] [9].

Operational Computers - In India as a whole only 70% of computers are operational. This is again a dismal state of the current ICT in schools. All the states are facing this problem. In some scenarios more than half of the equipment is not fully operational [10].



VI.OTHER EQUIPMENTS

E-readers, mobile phones and digital cameras. Almost all the students have access to mobile phones and are using it regular basis. The percentage of students having mobile phones goes up with the higher classes. The states like Orissa and Jharkhand this is still less pervasive. But access to digital cameras is still very low. With the usage of Smartphones this is being negated.

- ***A. Data projector -*** There are very few data projectors in schools. Only in states like Kerala and Maharashtra we can see usage of data projectors.
- ***B. Digitally equipped school –*** The notion of the digitally equipped school emerges from an analysis of survey data in five areas:- Equipment provision: numbers of desktop and laptop computers, e-readers, mobile phones, interactive white-boards, digital cameras and data projectors. The proportion of fully operational equipment. Broadband speed (above or below 10mbps) and type of broadband access (ADSL, cable etc.). Maintenance and support. Indicators of connectedness: a website, email addresses for teachers and students, a local area network, a virtual learning environment, or none of these.
- ***C. Cluster analysis -*** was carried out on the digitally equipped school data; three school profiles emerged that can be summarized as follows:
  Type 1: Highly digitally equipped schools, characterized by relatively high equipment levels, fast broadband and relatively high connectedness
  Type 2: Partially digitally equipped schools, with lower than type 1 equipment levels, slow (less than 10mbps) or no broadband[37], and some connectedness
  Type 3: As type 2 but with no connectedness

At all levels there are wide variations between states from those with almost all schools in type 1 to those with most schools in type 2, but in all states percentages of students in type 3 are in a majority. Tamilnadu, Kerala, Gujarat states have the highest percentages of students in type 1 schools at all levels, never falling below 75% and in most cases approaching 100%. On an average in over all states 27 per cent of class 5 students are in the first group of digitally equipped schools, 33 per cent are in type 2 schools, and 40 per cent in type 3.

- ***D. Broadband provision –*** Type of connection. Satellite access is consistently low but significantly higher in **Maharashtra.** 10% of students are in schools connected via fibre stands out and almost 45 % are connected over a cable network. Broadband speed.There is a spread across the range of broadband speeds, most schools within a wide range from under 512kbps to 10 mbps.
- ***E. Technical Support –*** Maintaining educational technology equipment is clearly an in-school task (either by teaching staff or technicians who are part of the school's personnel), rather than undertaken by an external organisation (public or private sector) in most of schools between 15% (Class 4) and 24%[35] (Class 10) of

students are in schools where the school personnel maintain equipment. Primary schools rely more on external support than secondary schools. The private sector is involved to some extent in maintaining
computer systems. In most schools a mix of types of support is reported – respondents could tick yes or no for each type of support available in the school.

F. Things to do - Capacity building, through sustained investment in teachers' professional development.Concrete support measures, accompanying specific policies at school level.Combined policies and actions, in different policy areas within a systemic approach.State-specific support, addressing large differences and degrees of ICT provision and implementation .Competence development: these four actions directed at effectively and dramatically increasing young people's digital competence and the key competences.

VII.CONCLUSION

The overall research suggest that successful ICT depends on many factors .National policies as well as school policies and actions taken have a deep impact on the same. Similarly there should be an ICT plan and support in Teachers professional development and to implement some new and different policies at school level.

Also need successful implementation of ICT to lead change in more about influencing and empowering teachers and supporting them in their engagement with students in learning rather than acquiring computer skills and obtaining software and equipments.

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