

Anil & Jayakumar, 2019

Volume 4 Issue 3, pp.1948-1962

Date of Publication: 8th March 2019

DOI-<https://dx.doi.org/10.20319/pijss.2019.43.19481962>

This paper can be cited as: Anil, A. & Jayakumar, M. S., (2019). ICT Integration in Education: The Case of Secondary Schools in Kerala. *PEOPLE: International Journal of Social Sciences*, 4(3), 1948-1962.

This work is licensed under the Creative Commons Attribution-Non Commercial 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

ICT INTEGRATION IN EDUCATION: THE CASE OF SECONDARY SCHOOLS IN KERALA

Arunima Anil

*ICSSR Doctoral Research Scholar, Department of Sociology, University of Kerala,
Thiruvananthapuram, Kerala, India*
arunimaanil15@gmail.com

M.S. Jayakumar

Assistant Professor, Department of Sociology, University of Kerala, Kerala, India
jayanmadavan@gmail.com

Abstract

“ICTs can reduce the gap between the most developed nations and those that lack necessary skills, resources and infrastructure”

(UNDP, 1999)

The quality of education in rural areas has not risen to the expected standard due to lack of access, inadequate infrastructure, poor connectivity of ICT, and insufficient number of teachers, etc. This empirical study aims at finding out the factors influencing successful ICT integration in rural schools with special focus on the availability of ICT infrastructure, extent of ICT utilization in classrooms and the barriers encountered in its effective usage. The findings indicate that ICT infrastructure is inadequate and its use in teaching and learning were found to be minimal and has not brought about much improvement. Under utilization of the technology has resulted in lowering the digital competency of the students. Frequent utilization of smart-classrooms along with a strong ICT infrastructure and their integration into teaching activities can play a significant role in facilitating digital education in rural schools.

Keywords

ICT, Digital Divide, Rural Schools, Infrastructure, ICT Utilization

1. Introduction

Information and Communication Technologies (ICTs) have become a vital part of the present society. It connects the world, becomes tool for many activities, and influences almost every aspect by disseminating information. Extraordinary advances in these technologies have resulted in a new age-‘The Information Age’. The agricultural age relies on ploughs and animals, the industrial age on engines and fuels and the information age on computers and the networks that interconnect them.

Thus education has become a vast and complex institution across the world which stimulates the integration of ICTs in school education. The use of ICT in school education in developing countries is quite different from that of developed ones. ICTs has revolutionised the education system and is used as a means for improving quality of education. The traditional lecture methods undergo rapid strides as schools insist on technology based teaching and learning.

Kerala has given prime importance for using information and communication Technology as a major enabler in enhancing the quality of education. From the year, 2010 onwards, the Kerala Government has consistently taken many steps to integrate and promote ICT – enabled education in the state through IT@ School project. It is being introduced to impart ICT- enabled education in more than 2,600 High schools of the state with a major emphasis in bringing desired improvements in the conventional teaching-learning process. The key policy change that drives this initiative was by integrating ICT in the mainstream curriculum particularly by bringing ICT as a compulsory subject in the school curriculum from standard 8th to 10th which is followed by another major policy shift as the usage of “ICT as an effective tool to teach all subjects”. Thus it would result in enhancing the productivity of teachers as well as improves student’s achievements. ICT infrastructure deployment, capacity building, and content development were the foremost phases in this transition from conventional system to “ICT education”.

1.1 Problem Statement

Information and communication technology is bringing substantial changes in the society. In rural education as well technology has brought tremendous benefits. Though Kerala shows comparably low rural urban divide in many other aspects, there is divide in the case of ICTs due to lesser ICT facilities, inaccessibility of ICTs, lower level of awareness, higher cost, lack of technical skills, etc in rural areas. The benefits of ICTs are not equal everywhere, it often creates disparities in developing and disadvantaged communities (UNESCO). The twin issues of

digital divide and social exclusion in rural areas has to be addressed seriously. Greater challenges are there in effectively implementing ICTs in rural schools.

Education has changed a lot from its conventional methods by the use of instructional materials and technology aids. Modernizing education with smart classes, digi-class, online content etc are the need of the hour. It takes education to a higher level beyond the four walls of a classroom. It can bring improvements in rural education and sustainable rural development. Increasing access to and improving the quality of education is given greater priority in developing economies. Education has a positive impact on ICT diffusion as it improves access to information, enhances quality and progress in education.

Today, though the rural schools are better than before, in the use of ICTs, a gap is still found as it is not uniform. Mostly, remote areas do not have basic infrastructural facilities, adequate resources, and suitable economic conditions. There are wide differences in integrating ICTs in schools. Some are in its infancy stage; others are in a matured stage while rests of them are in an advanced stage of development. There are many constraints in fully benefiting the potentials of technology in these schools.

In this context, the present research makes an attempt to study the adoption of ICT in rural schools with respect to ICT infrastructure and its utilization in the classroom.

1.2 Previous Research on ICTs in Education

Literature shows that there are controversies in fully utilizing the benefits of ICTs in rural areas. Moreover, the provision of ICT facilities is not adequate for the rural schools. Both Central and State Governments are initiating several ICT Schemes and are raising huge funds for bringing the potentials of ICTs in school education. ICTs related programmes in rural areas are not rising to high standards since it fails in assessing the priorities and needs of rural students.

Information and communication Technology refers to “the combination of manufacturing and services that capture, transmit, and display data and information electronically (OECD, 2002). “The rural schools in most respects has remained a decade or more as inferior to urban schools as they are faced with more problems such as lack of access, poor education systems, inadequate facilities, unsatisfactory home environments, lower teacher – pupil ratio and lack of adequate study materials etc. (Rogers & Burdge, 1972).

Even today rural areas are far behind in information provision and are represented as “information poor”. Developing countries are in more need of ICTs but they often faces many obstacles such as poor infrastructure, inequitable access, lack of basic skills, content, scarcity of resources etc (Shrum & Palackal, 2012). The growing gap in access and use of ICTs put the poorer societies behind the technology – rich societies. Whether the introduction of ICTs brings inclusion or exclusion is still a serious matter. Some are of the opinion that it further widens the

existing gap whereas some others opinion that it narrow down the gap between developing and industrialized countries. Developing countries can advance towards development with the help of ICTs. Income inequalities and ICT literacy gaps are the significant gaps between these countries (Narasaiah, 2007).

Rural areas are characterized as information poor and information provision is central to the development initiatives, since ICTs play a major role in bridging the information gap (Chapman & Slaymaker, 2002). Perceptions and attitudes towards rural schools underwent a negative opinion and do not gain much attention in national education agendas. In spite Organisation for economic development and cooperation (OECD) countries do not give much preference for rural education. In comparison with urban schools, they fall into disrepair, disrepute and even lack adequate material resources. This negative view of rural schools results in low expectations, inadequate attention and resources, as well as unsatisfactory conditions. Many rural schools are inadequate and are in need of assistance. In the past, the picture of rural education was not attractive but now new experiments are being undertaken to alter the situations. OECD countries take into account the rural education sector as a major constituency. This is because millions of children even today depend upon rural schools for educational purpose. The current research, innovations, and policies about rural education still need to be improved (Sher, 1981).

Growing disparities within countries, significant rural – urban gap, lack of proper educational delivery system, reluctance to basic education and growing number of disadvantaged populations are the major challenges faced by the Asian regions. Education for All (EFA), 2000 stressed the need for integrating information and communication technologies in order to achieve EFA goals. Use of ICTs penetrates into the grass roots level and benefits large number of people (Chatterjee and Khan, 2003). ICTs need to be used for reforming, for extending and in upgrading formal education in developing countries (Schramm, 1973). Large capital investment is required for integrating ICTs in education programs but developing countries stood far behind in financing the cost of ICT use. ICTs alone cannot provide solution to these problems. In spite ICTs can be used as an educational tool which helps in expanding access and quality of education (Rani, 2013).

“The Unequal distribution of ICT infrastructure (the digital divide) exists most prominently across geographic locations” and it has immense efficacy to provide access to learning resources in rural areas which are devoid of resources such as books, libraries, etc.

Deployment of ICT and viable infrastructure is a solution to many of the challenges that these areas face today (Shade, Awodele and Samuel, 2012). The rural – urban Divide in India by S. Rajagopalan, (2010) examines the rural – urban disparities existing in India. All the key

indicators of economic and social developments such as education, health, sanitation, electricity and penetration of ICTs, the rural areas lag behind its urban counterparts. He emphasizes that the facilities available for primary, secondary and higher education in urban areas are incomparably higher than those of rural areas.

The quality of education in rural areas is degrading as students in rural schools are not able to read and write or even do basic arithmetic calculations. Through the application of e-learning, web 2.0 and MOOCS (Massive Open Online Courses) the teaching- learning processes can be enhanced (Bari & Hoa, 2018). The constructivist approach emphasis that integration of ICTs results in developing new skills for students and in adopting better pedagogical approaches for teachers (Shukla, 2015).

1.3 Research Questions

The purpose of this study was to examine the application of ICT in rural schools with a major focus on the availability of ICT infrastructure, extent of its utilization in classroom practices as well as the barriers that hinders the effective usage of ICT in selected secondary schools in Kerala.

Specifically, this research study addressed the following questions:

- Whether rural schools are equipped with adequate ICT resources (hardware, software, network connectivity, instructional materials etc.)?
- What are the ways in which ICTs are used for classroom purposes?
- What are the key impediments in the adoption of ICTs in schools?

2. Research Method

Multi-stage random sampling was used to select the participants for this study. A random sample of 14 secondary schools was selected from three educational districts which include both Government and Private – Aided Schools. Headmasters, School IT co-ordinators and teachers from eighth, ninth and tenth grade of various secondary schools were the participants in the investigation. From each school, four teachers were selected based on their subjects being taught i.e. one teacher each from Natural Science, Social Science, Mathematics and Languages forms the sample.

In order to get diverse views from different stake-holders involved, qualitative methods of data collection was used as the primary method. Structured interviews were conducted with principals and School IT – Coordinators. In- depth interviews and focus group discussions with teachers were also done to gather qualitative data. Thus it includes observations of overall functioning of school, documentation of teachers' work related to ICT practices and extent of

ICT application in their teaching processes. In addition an interview guide and audio – visual documents including videos, photographs, and narrated slideshows were also used as instruments for the data collection procedures.

In order to determine the application of ICT in schools, mainly two items were analysed in this study: (1). ICT infrastructure and (2). ICT Integration in the classroom.

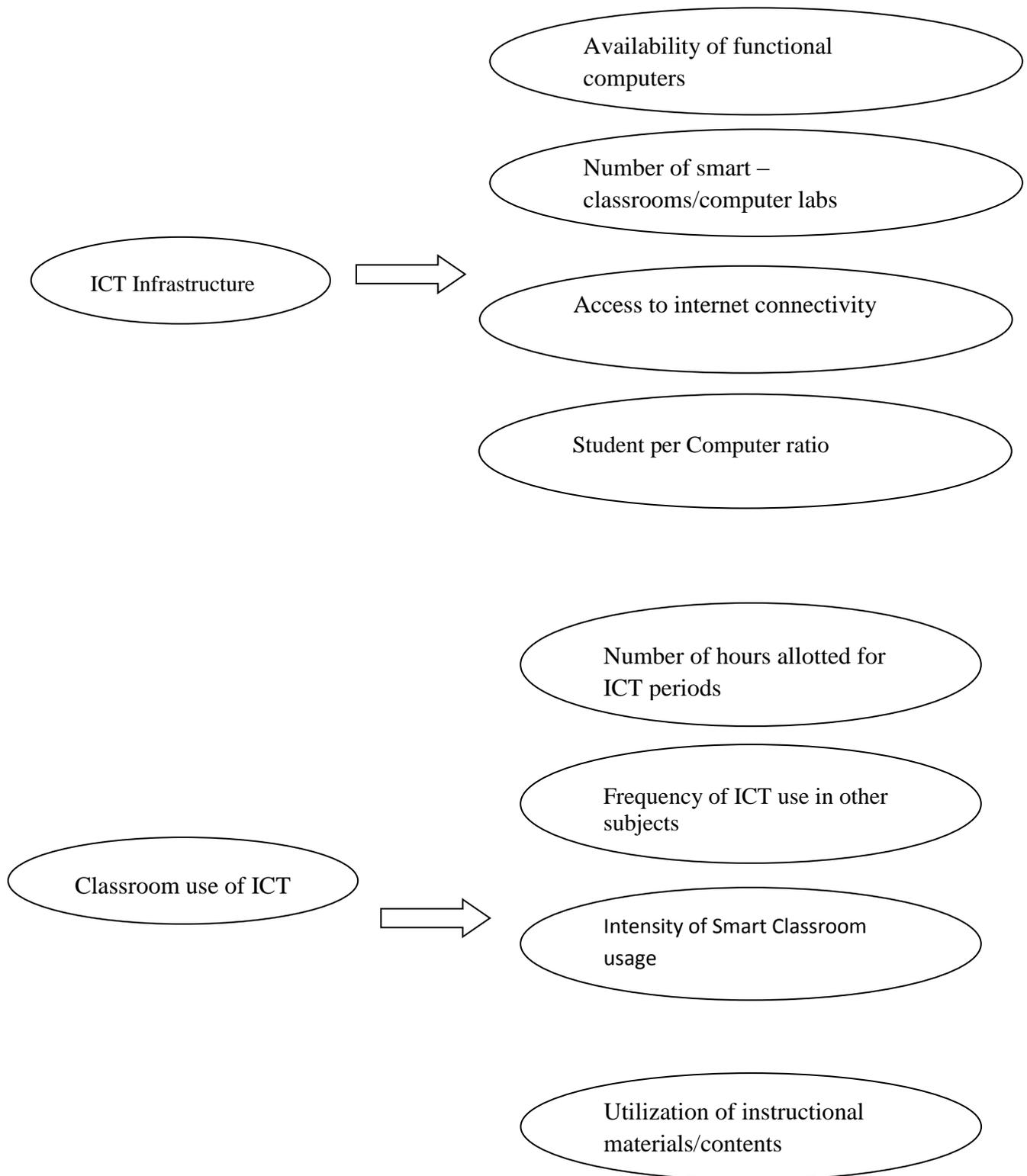


Figure 1: Variables for ICT Infrastructure and Usage

3. Discussion and Analysis

3.1 ICT Infrastructure at School

Creating appropriate infrastructure for enabling ICT education in schools is an integral part of the IT in Education Vision, 2010 of the Government of Kerala. As ICT is a separate subject in the curriculum, the availability of quality and adequate infrastructure is crucial in imparting ICT-enabled education. Availability of infrastructure such as computer labs, multimedia or smart classrooms, audio – visual equipment's, projectors, and interactive white boards were found to be much lesser among these schools. *“Lack of access to computers, laptops, insufficient ICT peripherals like projectors, digital screen, white boards, speakers, generators, UPS, inverter and limited space at computer lab”* were the primary reasons for non- usage of technology in most of the schools. Inappropriate furniture such as desks, tables, and chairs at computer labs also creates hardship for student's access.

3.2 Availability of Physical Infrastructure

The physical infrastructure of rural schools also poses serious issues. The school buildings itself were not feasible for ICT integration. In many schools, the buildings were “unfit” to conduct classes and they do not get consent from the authorities concerned to carry out classes in such unconditional buildings.

“Many of the classrooms are just separated by mere boards or wooden sheets and it does not have secured classrooms in order to equip with smart classes. Most of the classrooms were devoid of electric connections too.”



Figure 2: Condition of Rural Classrooms

3.3 Maintenance of ICT- Equipments

Maintenance and upkeep of core ICT infrastructure is more challenging for ICT-enabled education. *“More than three fourth of the computers deployed in schools were either damaged*

or non-functional”. The number of not-working computers out-numbered working computers. Large number of equipment’s were under repair or not used and were kept as e-wastes. Absence of technical staff also lags the maintenance of computers at school level. New computers were purchased in schools using MP/MLA funds, Local Area Development (LAD) Funds, Parent Teacher Associations (PTAs), Local Self Governments (LSGs), Non- Governmental Organisations (NGOs) and Alumni Associations etc. But the unavailability of funds to repair the damaged ICT equipment’s negatively affects the adoption of ICTs in schools.

“As one computer, is being used by several students at a time, frequently most of them were out of service” [ICT co-ordinator]. Lack of expertise and funds prevents schools to get the computers repaired on time. Government had set up ‘Hardware Clinics’ for repairing the damaged computers in High schools for free of cost. But rural schools finds difficulty in taking the damaged equipment’s to the hardware centre due to its distant location, high cost of transportation and unwillingness of teachers to accompany it.

3.4 Lack of Access to ICT- Equipments

Poor infrastructure build-up and low quality ICT equipments prevent rural schools to move towards a digital platform. All schools visited had a computer lab. Few schools do not have even a single smart classroom. *In one of the schools visited, a room was occupied to set-up smart class but it’s being used as ‘store room’ to keep files, records, unused books and sports equipments etc.* Lack of access to computer labs or smart classrooms along with limited resources lowers the level of ICT integration. ICT equipments at computer lab were just confined to few desktop computers, laptops and a projector.

“ICT adoption in school will be greatly improved if it had adequate equipments. Therefore schools need to be converted into high-tech schools for successful use of ICTs”.



Figure 3: ICT Facilities at Computer Lab

3.5 Internet Connectivity

Access to internet is equally important as access to adequate technology. Internet access can facilitate learning outside the four walls of the classrooms and enables learning to take place

at ‘anytime and anywhere across the globe’. It opens up immense opportunities for schools to connect to the learning resources anywhere in the world. For many of the schools studied, there was considerable variation in internet connectivity.

“Poor quality of connection and power failure are the major problems associated with internet connections in schools.” Some schools totally lack access to network connectivity while others were unsatisfactory due to poor bandwidth and slow connection. Though the school relied upon using optical fibre for internet connection, it does not provide reliable speed.

“Internet connection was interrupted for several months in schools situated at extremely remote areas.” As teachers do not have access to computer and internet facility at school, it reduced their use of ICT in teaching. Predominance of insufficient computers, older, less reliable, out dated machines inhibits the development of ICT capable schools. Availability of sufficient ICT resources either in computer labs or at classrooms prompts to make effective use of them. Most of the rural schools did not have necessary and adequate equipment’s such as desktop computers, laptops, multimedia projectors, interactive white boards and even fails to update the available resources.

“Most of the resources have to be downloaded from Internet but there is no internet connection in school to make use of ICT for learning and instruction.” [Science Teacher]

“There are a number of blogs and resource portals like maths blog, SS Club, English blog, mentors blogs, Science guru, School App, Samagra, Spandanam, etc. that provides end number of live videos and teaching manuals but due to slow speed and unreliable connection, use of internet for learning activities remains restricted.” [Mathematics Teacher]

3.6 Unavailability of Networked Computers

The use of internet doesn’t receive much attention in schools. Number of computers with internet connectivity in ICT lab was also found to be lesser. In most schools, internet connection was available in one or two computers only. In some, none of the computers were networked. Lack of access to the internet confines schools in getting online.

“Internet is available only at office room and is being used mainly for administrative purposes only and teachers were reluctant to use it due to the unavailability of net connection in computer lab” [ICT co-ordinator]

3.7 Students’ Access to Computers

Lack of access to resources was also regarded as a major barrier for poor ICT integration in schools. Many schools had less number of computers and laptops, out of which, more than half are out of order or under repair. Some are having minor issues while others are not working due to major problems. Computers were installed only at computer lab for students and teachers’ use. They do not get access to resources at classroom, staff room, or even libraries.

“Students get access to computer only during ICT periods, lunch hour, and after school hours”.

3.8 Student to Computer Ratio

There were tremendous differences in the ratio of students per computer in each school. Student per computer ratio were correlated with the strength of students and the number of available computers in school. Student -to - computer ratio in schools varied from 3:1 to 12:1. It was found that in most schools, students in a class or division were split up into two halves based on their gender. During ICT period, either boys or girls were taken to the computer lab and in the subsequent class hours, i.e. during the second turn, next batch was allowed to enter the lab. Schools with lower student strength had a ratio of two to three students per computer where as those schools having higher number of students had a ratio of seven to twelve students per computer.

Limited resources in schools restrict students to have hands on experiences. Higher proportion of students in rural schools had less or no access to computers at their homes. Therefore school is the only place for them to have computer accessibility. On an average, schools should ensure one computer for every two students. “The average users per computer ratio of minimum 2:1 are to be maintained in all schools. Establishing appropriate and adequate ICT infrastructure can maximise ICT application in rural schools”.

Unavailability of computer labs, lack of access to adequate technology, damaged equipments, inappropriate technical support and intermittent connectivity along with physical constraints like unsuitable buildings, absence of wired classrooms, and insufficient space of smart class rooms were the factors influencing successful integration of ICTs in rural schools. Provision of quality infrastructure is a strong determinant for proper implementation of ICTs in schools.

3.9 ICT Integration in the Classroom

The success of ICTs in education depends upon their proper introduction into the educational system. ICT- based education has become part of the curriculum and is a compulsory subject at secondary level, at the same time it is used as a tool for enhancing the effectiveness of all subjects. ICT education is not envisaged merely as an ICT course; apart it aims at a holistic approach for ICT enabled teaching – learning process.

Findings from the in-depth interviews indicate that the degree of ICT integration is not channelized in proper ways in most of the schools. *“ICTs is mainly used for administrative purposes, the application of ICT for pedagogical and learning activities was of lowest limit due to limited resources, insufficient ICT competence and indifferent attitude of teachers, limited ICT*

training, and absence of adequate skilled staffs for support results in lower integration of technology.”[School Principal]

3.10 Number of Hours per Week for ICT

Average number of periods allocated in the timetable for delivering ICT courses was four periods in a week. Out of which two periods are set apart for theoretical classes and another two for practical classes. In some of the schools, the specific periods for ICT courses were reduced to three periods a week in the timetable. Even during these periods other subject teachers rushes to the class to teach their subjects. *“The use of ICT in school is restricted to the ICT subject whereas it is not used in teaching other subjects such as natural science, social science, and languages. It is necessary to make use of ICT for teaching all the subjects”*. [ICT-Coordinator]. Students in 8th and 9th grades get less exposure to ICT periods than those in 10th grades.

3.11 Effective Usage of Smart Classrooms

‘Intensity of Smart- classroom use’ varies across the schools. There was no frequent use of smart – classrooms to facilitate teaching – learning process. Only a few schools had smart-classrooms which stood as a major barrier for ICT-enabled education. In order to deliver ICT classes teachers have to take students to the computer lab always. Mostly the smart classes were equipped by other teachers or utilized for various other purposes like conducting seminars, workshops or training programs. Even in those schools that possess smart classes, it is not used frequently due to lack of interest of teachers, lack of time, overload of curriculum etc. In one school, students destroyed the ICT equipments in the classroom. Findings from the study indicate that ICTs is often underutilised that is it is not being frequently integrated into the curriculum or pedagogical practices in a systematic manner. Very few schools show some sorts of positive outcomes towards ICT integration.

3.12 Level of ICT Utilization

‘Level of ICT utilization’ at the school was also found to be lower. Usage of projector for teaching, interactive board for delivering lessons and creating videos and tutorials to engage students were rarely used in rural schools. The lower the utilization of ICTs in schools, lesser is the chance to move towards a digital platform. For bringing greater innovation and enhancement in education, regular and frequent utilization of smart – classrooms and computer labs is essential.

“Though teachers showed great interest to prepare notes and download materials from internet in order to send to students through WhatsApp or mail, the greater barrier is that most of the students in rural schools do not have access to computers, net connection, or even smart phones at their homes.”

“A huge percent of students in these schools came from socially and economically backward families. They are seeing computers for the first time at school and for them school is the only place to access ICT.”[ICT- Coordinator]

“Even though ICTs cannot be integrated in teaching, teachers used it for updating information, collecting materials, creating contents and communicating with others” [School Principal]



Figure 4: *ICT Integration in Classroom*

3.13 E-Resources/ Digital Contents

Supply of adequate contents for various subjects and increasing the ICT competence of teachers were also considered as key factors for effective use of ICT in classroom. Teachers' negative attitude, lack of technical knowledge and skills also stood as major obstacles for ICT integration in classroom.

“I am frustrated in using technology in front of students as I always depend upon IT-coordinator for assistance.” [English Teacher]

“Lack of access to ICT resources in schools restricts teachers from utilizing ICT in classroom.” [School Principal]

A teacher aged 51 opined, *“It's not because of interest I am using ICT in school but was compelled to do so. My physical constraints prevents me from using it”*

“I could just do few basic tasks on computer, but not so confident enough to use in my daily teaching activities” [Language Teacher]

“It's productive in spending more time for using ICTs, but there are many constraints in integrating it during regular class hours.” [Social Science Teacher]

“Only in regular ICT course periods, students were taken to the computer lab and its usage in other subjects was very minimal.” [ICT Co-ordinator].

More subject-based ICT training was required for teachers. They were reluctant to develop digital contents due to lack of time, limited ICT training and considered it as an extra workload and burden which take much of their time. Usage of digital instructional materials could not be integrated completely into learning. The result revealed that teachers are not involved in using digital content in their subjects. In order to increase the digital content delivery; teachers should have access to resource portals, collaborative content development programmes and supply of resource CDs, etc from various educational departments or agencies.

“Though I always collected several instructional materials like videos, audio-clips, Power Points, etc. it cannot be used to a greater extent in my subject due to poor infrastructure support and lack of time.”[Science Teacher]

“Due to lack of resources in school, I often take my mobile phone to classrooms for delivering instructional materials. It is the only way possible to adopt technologies in the classrooms”.

“Absence of Smart classrooms is the formidable barrier in effectively using ICTs in the teaching-learning process.”

“The contents downloaded from educational sites or those supplied by educational authorities were often lengthy and does not matches with the curriculum, thus it distracts the effective delivery of digital materials. Only to a lesser extent it is used in classrooms.” [Language Teacher]

4. Conclusion

The present research focused on the adoption of ICT in rural schools from two broader perspectives, namely availability of ICT infrastructure and its effective utilization and integration in the classrooms. High cost of equipment's, weak infrastructures, inadequate funds, lack of skilled ICT professionals, lack of appropriate organizational support, unwillingness of teachers to adapt to new technologies, poor internet connectivity, delay in maintenance are stumbling blocks on the adoption of ICTs in schools.

The result point out that ICT integration in schools is significantly associated with the provision of strong ICT infrastructure build-up. Most of the previous studies indicate that for the successful integration of technology, development of ICT infrastructure is at most essential.

Rural schools are lagging behind in enabling adequate ICT resources, network connectivity, and even physical facilities like quality classrooms with electric connections, un-fit buildings, adequate space, and furniture's etc. It was found that the number of desktop computers, laptops and smart – classrooms are not feasible for ICT enabled education in most of the schools. The student to computer ratio in the schools ranged from 3:1 to 12:1 which is insufficient for students to access computers. Those schools with higher student strengths were

devoid of enabling adequate computers. Students also have limited time for using the computers and were not getting equal chance for accessing ICT devices. The technical quality of equipment's appeared to be lower which prevents from successful use of ICT. School administrators do not timely replace the damaged equipments which also reduces student's utilization.

The findings about the integration of ICT in classrooms reveals that teachers attitude, poor ICT competence, lack of time, inadequate instructional materials and absence of smart-classrooms reduces the use of ICT in teaching- learning activities. In terms of ICT integration, a paradigm shift occurs in Secondary schools. From the introduction stage schools had moved towards an integration stage but have not reached the stage of effective utilization of technology.

5. Recommendations for Future Research

Therefore further studies need to be carried out in order to understand the relationship between ICT and education by analysing varied factors such as national and local level policies and practices, role of ICT in making teaching-learning more effective, in improving academic standards and dynamics of technologies in bringing change and innovation in rural schools. Further comparative studies between urban and rural schools, public and private schools, similarly its scope in higher education would be applicable in this perspective. Potential institutional and individual barriers of ICT adoption in schools can also be examined as a direction for future research.

References

- Chatterjee, Baskar & Khan, Qutub. (2003). Rural Education Status and Trends global scenario: Occasional Monograph series. New Delhi: Indian Council of Social Science Research (ICSSR).
- Chapman, Robert & Slaymaker, Tom. (2002). ICTs and Rural Development: Review of the Literature, Current Interventions, and Opportunities for Action. Working paper 192. UK: Overseas Development Institute. doi:www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/2670.pdf
- Bari, M, Djouba, R & Hoa, C.P. (2018). Elearning current Situation & Emerging Challenges. PEOPLE: International Journal of Social Sciences, 4(2), 97-109.
<https://dx.doi.org/10.20319/pijss.2018.42.97109>.
- FAO/IIEP. (2002). Education for Rural Development in Asia: Experiences and Policy Lessons. IIEP.
- Gopalan, Raja S. (2010). Rural-Urban Dynamics Perspectives and Experiences. Hyderabad: Icfai Books.

- Narasaiah, Lekshmi M. (2007). *Information and Communication Technology and Education*. New Delhi: Discovery Publishers.
- Palackal, Antony & Shrum, Wesley. (2007). *Information Society and Development*. Jaipur: Rawat Publications.
- Rani, Rekha. (2013). *Role of ICT in Education*. New Delhi: Swastik Publications.
- Rogers, M. Everett & Burdge, J. Rabel. (1972). *Social Change in Rural Societies*. Second Edition. New York: ACC Sociology Series.
- Schramm, W. (1973). *Big Media, Little Media*. Calif: Institute for Communication Research, Stanford University.
- Shukla, Ashka. (2015). Constructivism and Integration of ICT: Powerful Blend of Teaching-Learning Process. *PEOPLE: International Journal of Social Sciences*, 1(1), 82-90. <https://dx.doi.org/10.20319/pijss.2015.s21.8290>.
- Shade, O Kuyoro, O. Awodele & O. Samuel, Okolie. (2012). *ICT: An Effective Tool in Human Development*. *International Journal of Humanities and Social Sciences*. Vol.2 (7157162). pdfs.semanticscholar.org/408b/2c623982fcf46d61eb9c7e5fc622c4c71ea6.pdf
- Sher, Jonanthan P. (1981). *Rural Education in urbanized nations: Issues and innovations*. West View Press publications.