

Challenges in Universalizing ICT in Education in Rural Areas

Dr. Dinesh Kumar

Principal
DIET, Ghumanhera, Delhi

Laxmi Dagar

Sr. Lecturer
DIET, Ghumanhera, Delhi

Abstract

The country populace living with least degree of ICT offices particularly poor people, both Central and State Governments and NGOs also are apportioning colossal sum for the improvement of ICTs in provincial training. However the degree of progress and availability of ICTs in country schools didn't arrive at the normal level. This paper endeavors to discover the holes and to offer plans to work on the country instruction through ICTs, particularly PC related advancements. It additionally gives a few ideas to successful execution of the National Policy for ICT in training in rustic regions. Despite the fact that ICT can possibly further develop schooling arrangement of a country generally, yet it isn't the situation in the non-industrial nations. There are various issues and difficulties going up against the execution of ICT instruction in schools and instructive establishments in these nations and the issues are significantly more amplified in the event of schools situated in far off towns and provincial regions. One of the primary impairments to foster the instructive capability of ICT comes from the conventional culture of schools. All things considered, the Government is by all accounts moving expediently enough in making the essential foundation at the earliest opportunity, though for the latter, the buyers in metropolitan regions have as of now gone through the underlying period of openness to computerized configuration of schooling and are currently savvier to pick the right substance to enhance the disconnected homeroom based educating learning. The enormous chance lies in country regions wherein the computerized arrangement can get large gains. One significant result of computerized training would be expanded cooperation between students in all fragments. Independent and on-request learning would likewise acquire further energy in future. The review makes some huge ideas for improving and empowering ICT training in India explicitly the tremendous rustic India. To make ICTs powerful and vital apparatuses of training, checking and assessment should be a need. The metropolitan rustic gap as far as access, value, and assets will keep on being the fundamental issues that Indian instructors should address as the necessities of the learning local area will change on the need premise.

Keywords: Information and Communication Technology, Innovations, Digital Literacy, Rural India.

Introduction

Probably the greatest hindrance in imparting ICT instruction in provincial regions is absence of mechanical data sources, web access and deficiency of prepared experts.

Around 68% of India's all out populace live in the country regions and 30 percent of this is under 15 years old in their pinnacle early stages of tutoring. Almost 33% of provincial India is as yet ailing in ICT. In the present circumstance, giving ICT empowered training in provincial regions could be an imaginative choice to fill the proficiency hole and to redesign the instructing learning measure in the rustic schools for tapping the tremendous stores of HR. This review investigates the hindrances to utilizing data and correspondence innovations (ICT) for instructing and learning measure in the nation of India as demonstrated by partaking partners: understudies, educators, and directors and it likewise recommends some reasonable arrangements empowering smooth execution of ICTs in provincial training areas with most extreme effect. Probably the greatest worry of instructors from one side of the planet to the other, and particularly in India, is preparing the current age of students future. India is similarly youthful as a country with around 28 million youth populace being added each year. More than 50% of our populace is underneath the age of 25 and a bigger number of than 65% are under 35. In 2020, the normal time of Indian populace is relied upon to be 29 years, while it is 37 for China and 48 for Japan¹. In any case, India's high youth populace will not be of any assistance to the economy if widespread schooling isn't accomplished all over. The improvement of a nation principally relies upon its schooling framework. Education is a legitimate pointer of financial turn of events. In the event of India, it is as yet a non-industrial country, since its schooling framework is as yet behind numerous other created countries, it is significant that we ought to comprehend the need of training and its part in cutting eventual fate of Indian young people. Data Technology can assume a vital part in fostering the country schooling framework in India just as it would guarantee mindfulness among the rustic populace about significance of training. Nonetheless, in India advantages of ICTs are not yet reached anticipated level in the rustic regions. The country populace living with least degree of ICT offices particularly poor people, both Central and State Governments and NGOs also are apportioning colossal sum for the improvement of ICTs in provincial training. However the degree of progress and availability of ICTs in country schools didn't arrive at the normal level. This paper endeavors to discover the holes and to offer plans to work on the country instruction through ICTs, particularly PC related advancements. It additionally gives a few ideas to successful execution of the National Policy for ICT in training in rustic regions.

Need for ICT in Education

Data and Communication Technologies can be characterized as all gadgets, instruments, content, assets, discussions, administrations, advanced and every one of those that can be changed over into or conveyed in computerized structures, which can be sent for understanding the objectives of instructing and getting the hang of, improving admittance to and reach of the assets, working of limits, just as the executives of the instructive framework. These won't just incorporate equipment gadgets associated with PCs, and programming applications, yet additionally incorporate intuitive advanced substance, web and other satellite specialized gadgets,

radio and TV administrations, other online substance stores, intelligent gatherings, learning the executives frameworks, and the board data frameworks. These would likewise incorporate cycles for digitisation, sending and the board of content, advancement and execution of stages and cycles for limit improvement, and making of discussions for association and trade. ICT has become part of our daily existence and all areas from banking to the travel industry currently rely totally upon ICT for completing their exchanges. The National educational program structure 2005 has featured the significance of ICT in school training. For what reason do we require ICT in schools? Was the instruction not occurring before PCs came? For what reason is this change in outlook fundamental? The shift is vital on the grounds that this is the time of data and innovation, an age that expects that instructors work with the get-together of this data and not just educate.

Lamentably, in India, ICT is to a great extent connected with the utilization of PC and Internet as it were. What one uses ICT for and how one uses it, isn't tended to adequately yet. Schools and universities get PCs, Internet association, LCD projectors and afterward depute educators for compressed lessons that evidently train them to utilize innovation. The difficulty is this entire methodology is deficient with regards to center. However, until educators are made to understand the need of ICT, no measure of computerization could help. An inquiry I regularly hear from educators who are reluctant to take the ICT plunge is, 'Can the understudy learn anything without the instructor clarifying or mediating? What's more, my response to this is, 'Understudies likewise have thoughts of their own and information that they assembled from day to day existence; these information and thoughts are not acknowledged or used by instructors. Utilizing ICT, this can be accomplished effectively.' Teachers must be prepared to work with the learning system, to make the cycle genuine, reachable, testing, yet intriguing and not scaring. Lessening educator talk time and empowering understudy conversation is vital. Everything need not be composed on writing board to be considered as educated. Numerous instructors believe that PC is utilized uniquely to make content look appealing! They need to realize that in 21st century, data isn't exceptionally hard to access, rather sorting out, sharing, and teaming up have become fundamental abilities. Subsequently, ICT isn't simply to depict data yet to collaborate, offer, and in this manner learn. ICT gives significant, possessing media that makes educating learning more useful.

ICT Initiatives in Indian Education

Thinking about the enormous significance of ICTs, the public authority of India has detailed the National Policy on ICT empowered school training which targets getting ready youth to take part imaginatively in the foundation, food and development of an information society prompting all round financial advancement of the country and worldwide seriousness. In India, ICTs was dispatched in schools in December 2004 and modified in 2010 to give freedoms to auxiliary stage understudies for expanding upon their ability on ICT abilities and direct them towards PC helped learning measure. ICT in schools have been incorporated under the Rashtriya Madhyamik

Shiksha Abhiyan (RMSA)¹⁷. The plan is a significant impetus to connect the advanced gap among understudies of different financial and other topographical obstructions. The plan additionally offers help to States and Union Territories to set up PC labs on manageable premise. Exploration shows that ICT assumes a main part in advancing the economy of a country. The job of ICT is multidimensional. ICT is seen as a "significant instrument for building information societies"¹⁸ and, especially, as a component at the school instruction level that could give a way of reevaluating and upgrade the instructive frameworks and cycles, along these lines prompting quality training for all. In spite of the fact that ICT foundation without anyone else may not add to a nation's economy, it is accepted that it works with by and large financial development. ICT can reinforce the economy in explicit areas or in explicit cycles that lead to monetary development. Be that as it may, ICT is just a device for accomplishing higher monetary development and not an end in itself. Academicians, industrialists and strategy creators will in general acknowledge an immediate relationship between utilization of ICT and positive macroeconomic development. ICT plays an essential part in associating the rustic economy to the rest of the world for trade of data, a fundamental need for financial turn of events. Successful utilization of ICT can obliterate geological limits and can carry rustic networks nearer to worldwide monetary frameworks. There is no question soon improvement will dependent on ICTs.

The motive of the national policy on education is to create an environment of integrated development for education and economic empowerment of rural students. Important initiatives and strides have been taken in the sphere of rural education:

- Computer literacy projects for teachers and students
- Mobile classrooms through IT buses
- E-Learning centers and kiosks for enhancing online education for social and economic change in rural society
- Community Tele-centers to meet the needs of ICT learning outside formal school setting · Bicycle-based connectivity in rural areas
- National award for teachers using ICT in schools in the teaching learning process · Development of IT curriculum
- Innovative Rural Reach Program by Infosys for imparting first hand ICT knowledge to children of grades 5-10 in villages
- Higher education ICT initiatives such as E-Gyankosh, Gyan Darshan, Gyan Vani and various other distance education programs.

Challenges in Implementation of ICT Enabled Education

Despite the fact that ICT can possibly further develop schooling arrangement of a country generally, yet it isn't the situation in the non-industrial nations. There are various issues and difficulties going up against the execution of ICT instruction in

schools and instructive establishments in these nations and the issues are significantly more amplified in the event of schools situated in far off towns and provincial regions. One of the primary impairments to foster the instructive capability of ICT comes from the conventional culture of schools 21, 22, 23. For country schools in explicit, the presentation of ICT faces obstacles as inner and outer hindrances. Inward obstructions to ICT execution in schools in country areas include:

- Lack of trained teachers is a major obstacle in the use of ICT in rural education is the lack of knowledge and skills.
- Research studies have reported a number of barriers/obstacles teachers experience in using ICT in their classrooms
- McCarney reported that the inadequate number of computers, dearth of class time for students to use computers and insufficient free time for learning were the most significant barriers. Insufficient training and paucity of professional development programmes for integrating technology.
- Paucity of software, lack of funds, inadequate time and lack of technical skills were also found to be the major barriers to the usage of technology in most Jordanian schools.
- Shortage of time in schools, teachers are usually burdened with multiple tasks other than teaching.
- Issues of maintenance and upgrading of ICT equipment in rural schools is subject to their limited financial resources. Largely, the government initiatives are restricted by budgetary constraints.
- A large proportion of the educational software produced in the world market is in English.
- Shortage of equipments that is lack of computers and computer-related resources such as printers, projectors, scanners, etc. in government schools in rural areas.
- Even the basic ICT equipments and computers possessed by rural schools are unreliable and undependable. The schools lack up-to-date hardware and software availability.
- Lack of technical support in rural schools face issues related to technical know-how, absence of ICT service centers, shortage of trained technical personnel.
- Other external factors inhibiting the usage of ICT in rural schools are social and cultural factors inherent to these regions, lack of initiative by community leaders, corruption and burglary.
- There is resistant from teachers, basically from older teachers as compared to younger ones, to apply ICT in their subject

- Overall the school level barriers can be further classified into two categories: one related to school ICT infrastructure and other related to technical and administrative support provided by the school.

The Possible Suggestions for Better Implementation of ICT in Rural Schools of India

At present in India, ICT in school instruction is completely restricted to a modest bunch of first class schools. Past that, it's simply a PC lab that is held separated from the customary instructive interaction. Though PCs came to Indian study halls in the year 1984-85, the degree of reception of current innovation in the educating and learning measure has been restricted and lopsided. Different ICT instruments should be accessible and it should be open at interest. Many schools have restricted assets for purchasing books, writing material, furnishings and other study hall materials. Job of private area offering types of assistance in such areas might be considered. Rustic populace will most likely be unable to pay robust sum to use such ICT assets for instruction. One of the extraordinary difficulties for quality control in training is absence of principles for boundaries to quantify the nature of instruction. For the arrangement of this all the accreditation bodies like NAAC, NBA AICTE, CBSE and different specialists should sit together and course a standard rundown of boundaries to choose the nature of training. India is creating as an information economy and it can't work without the help of ICT. The hole among request and supply of training has required the public authority and establishments to detail arrangements for more advantageous utilization of ICT. To overcome any barrier, it is important to develop participation among public and private partners. There is a need to zero in on working on four parts of ICT - access, utilization, monetary effect and social effect. The review makes the accompanying ideas for improving and empowering ICT training in country India:

- The States will establish state of the art, appropriate, cost effective and adequate ICT and other enabling infrastructure in all secondary schools
- Based on the size of the school, needs of the ICT programme and time sharing possibilities, States will define an optimum ICT infrastructure in each school.
- Each school will be furnished with no less than one PC lab with somewhere around 10 arranged PC passages regardless. Every research center will have a limit of 20 passageways, obliging 40 understudies all at once. The proportion of complete number of passages to the number of inhabitants in the school will be managed to guarantee ideal admittance to all understudies and educators.
- In composite schools, selective research facilities with fitting equipment and programming will be accommodated the auxiliary just as higher optional classes.
- Furthermore, no less than one homeroom will be outfitted with fitting general media offices to help an ICT empowered educating learning.

- Appropriate equipment for Satellite terminals will be given to chosen schools in a reformist way.
- Computer passageways with web network will be given at the library, educators' normal room and the school administrative center's to understand the proposed destinations of robotized school the executives and expert improvement exercises.
- Instructors and understudies will be taught on issues identified with the protected utilization of web Firewalls and other safety efforts will be carried out to monitor the school network against digital assaults and abuse of the ICT offices. Suitable rules for network security will be created.
- An EDUSAT will be arranged at each state with intelligent terminals (SIT) and get just terminals (ROT)
- A product climate preferring teaching method of realizing which advances dynamic learning, participatory and community practices and sharing of information is vital for sustain an imaginative society. Free and Open Source Software – working framework and programming applications will be liked to extend the scope of learning, creation and sharing.
- A wide assortment of programming applications and apparatuses, working out positively past an office suite is needed to fulfill the needs of a wide based ICT proficiency and ICT empowered showing learning program. Illustrations and activity, work area distributing, web planning, data sets, and programming instruments have the capability of expanding the scope of abilities and applied information on the understudies and educators. A sensible blend of programming applications will be presented in schools.
- Sufficient wellbeing precautionary measures and rules for use will be set up. Every research facility will be furnished with a compact fire douser and understudies and instructors prepared in its utilization. A fitting fire drill will likewise be executed.
- Capacity working of instructors will be the way in to the far and wide mixture of ICT empowered practices in the educational system. A staged program of limit building will be arranged. In assistance preparing of instructors will involve Induction Training just as Refresher Courses. The enlistment trainings will be conferred by the Regional Institutes of Education of the NCERT, SCERT or such different establishments of the Central and State Governments and will ideally be finished before the beginning of the scholastic year. The boost trainings will be done each year to empower educators to share, learn and stay informed concerning the most recent patterns in ICT based showing learning measures. The enlistment preparing will be trailed by educator's assessment to guarantee that the base capability is accomplished.
- Beginning with an underlying sensitisation through ICT functional abilities and ICT empowered subject showing abilities, instructors will turn out to be important for online expert gatherings (for example English educators relationship) to proceed

with their schooling, pool in their assets and effectively add to the reinforcing of space explicit information inside the country. The discussions will likewise work with consistent improvement of ICT abilities acquainting them with instruments and assets in various subjects/specializations just as make and offer learning assets in those subjects.

- School heads will likewise be prepared in measures prompting mechanization of organization, the executives and checking of the educational system and will assume a proactive part in the execution of School Education Management Information System (SEMIS) · States/Districts Education Department staff at all levels will be arranged to implant ICT into their work. They will likewise be arranged to different viewpoints identified with the ICT execution at the school level, SEMIS and food of the ICT framework.
- National and State level offices, similar to the National Council of Educational Research and Training, the Central Institute of Educational Technology, the National Institute of Open Schooling, the State Councils of Educational Research and Training, the State Institutes of Educational Technology or some other public instructive organization assigned by the State will foster educational program, assets, and attempt limit building programs, which will fill in as models for variation and execution across the framework. These exercises won't be re-appropriated.
- The States' Department of Education will lead a warning gathering to direct the execution of the ICT program, its observing and assessment. The warning gathering will comprise of the concerned Departments, a rumored designing Institute of the State, University Departments, and so forth thinking about the assortment of specialized, instructive, monetary and managerial errands included. The States' Department of Education will synergise with the suitable divisions and state level offices to guarantee the foundation of availability and power in all schools. This will incorporate arranged standards for valuing, nature of administration and support.
- At last, Program Monitoring and Evaluation Group (PMEG) of the Department of School Education and Literacy, Ministry of HRD, Government of India, will be entrusted with the general liability of directing the execution of the ICT program in schools the nation over. The PMEG might set up task gatherings and welcome organizations or set up experts with considerable mastery in that area to foster standards, details, rules, assessment reports, white papers and so on to direct the States in executing the ICT programme.

Conclusion

The future guide of ICT-put together training depends with respect to a speed of broadband entrance, accessibility of web-empowered and versatile viable learning content and development of shoppers in tolerating the advanced arrangement of

schooling. All things considered, the Government is by all accounts moving expediently enough in making the essential foundation at the earliest opportunity, though for the latter, the buyers in metropolitan regions have as of now gone through the underlying period of openness to computerized configuration of schooling and are currently savvier to pick the right substance to enhance the disconnected homeroom based educating learning. The enormous chance lies in country regions wherein the computerized arrangement can get large gains. One significant result of computerized training would be expanded cooperation between students in all fragments. Independent and on-request learning would likewise acquire further energy in future. The review makes some huge ideas for improving and empowering ICT training in India explicitly the tremendous rustic India. To make ICTs powerful and vital apparatuses of training, checking and assessment should be a need. The metropolitan rustic gap as far as access, value, and assets will keep on being the fundamental issues that Indian instructors should address as the necessities of the learning local area will change on the need premise.

References

- Agyei, D., and Voogt, J. (2011). ICT use in the instructing of science: suggestions for proficient advancement of pre-administration instructors in Ghana. *Instruction and Information Technologies*, 16(4), 423–439. <http://dx.doi.org/10.1007/s10639-010-9141-9>
- Alessi, S. M., and Trollip, S. R.(1985). *PC Based Instruction: Methods and Development*. New Jersey: Prentice-Hall, xiii + 418 pp.
- All India Council for Technical Education (AICTE), India, Retrieved from – <https://www.aicte india.org>
- Al-Senaidi, S., Lin, L., and Poirot, J. (2009). Hindrances to taking on innovation for instructing and learning in Oman. *PCs and Education*, 53(3), 575–590. <http://dx.doi.org/10.1016/j.compedu.2009.03.015>
- ASER (2014). *Yearly Status of Education Report (Rural)*. Worked with by PRATHAM, Available: www.asercentre.org.
- Auxiliary Education Management Information System (SEMIS), National University of Educational Planning and Administration, New Delhi, India.
- ChanLin, L.J., Hong, J.C., Horng, J.S., Chang, S.H., and Chu, H.C. (2006). Elements impacting innovation reconciliation in instructing: A Taiwanese viewpoint. *Advancements in Education and Teaching International*, 43(1), 57–68. <http://dx.doi.org/10.1080/14703290500467467>
- Copley, J., and Ziviani, J. (2004). Obstructions to the utilization of assistive innovation for youngsters with numerous incapacities. *Word related Therapy International*, 11(4), 229–243. <http://dx.doi.org/10.1002/oti.213>
- Davis, N.E., and Tearle, P. (Eds.). (1999). *A Core Curriculum for Telematics in Teacher Training*. Accessible: www.ex.ac.uk/telematics.T3/corecurr/tteach98.htm

- Dzidonu, J. (2010) The job of ICTs to accomplishing the MDGs in instruction: An Analysis of the Case of African Countries, Accra Ghana. <http://www.ait.edu.gh>
- EDUSAT likewise called GSAT-3, Indian Space Research Organization, India, Retrieved from - https://www.isro.gov.in/class_rocket/edusat
- Ertmer P. A. (1999). Addressing first-and second-request boundaries to change: techniques for innovation reconciliation. *Instructive Technology Research and Development*, 47, 47–61. <http://dx.doi.org/10.1007/BF02299597>
- Focal Board of Secondary Education (CBSE) , New Delhi, India
- Galanouli, D., Murphy, C. and Gardner, J. (2004). Educators' impression of the viability of ICT-skill preparing. *PCs and Education*, 43, 63–79. <http://dx.doi.org/10.1016/j.compedu.2003.12.005>
- Georgina, D. A., and Hosford, C. C. (2009). Advanced education workforce insights on innovation incorporation and preparing. *Instructing and Teacher Education*, 25(5), 690–696. <http://dx.doi.org/10.1016/j.tate.2008.11.004>
- Head servant, D. L., and Sellbom, M. (2002). Boundaries to embracing innovation for educating and learning. *EDUCAUSE Quarterly*, 25(2), 22–28.
- Higgins, S. and Moseley, D. (2011). Instructors' Thinking about ICT and Learning: Believes and Outcomes. *Diary of Teacher Development*, 5 (2), pp. 191-210. Accessible: <http://dx.doi.org/10.1080/13664530100200138>
- Ihmeideh, F.M. (2009). Boundaries to the utilization of innovation in Jordanian pre- schoolsettings. *Innovation, Pedagogy and Education*, 18(3), 325-341. <http://dx.doi.org/10.1080/14759390903255619>
- Ilomäki, L. (2011). Does Gender Have a Role in ICT among Finnish Teachers and Students?. *Scandinavian Journal of Educational Research*, 55(3), 325-340. <http://dx.doi.org/10.1080/00313831.2011.576910>
- Jhurree, V. (2005). Innovation Integration in Education in Developing Countries: Guidelines to Policy Makers. *Worldwide Education Journal [Electronic]*, 6 (4), pp. 467-483. Accessible: <http://ehlt.flinders.edu.au/instruction/iej/articles/v6n4/jhurree/paper.pdf>
- Jones, Andrew, British Educational Communications and Technology Agency (BECTA), corp maker. (2004) A survey of the examination writing on hindrances to the take-up of ICT by instructors.
- Karasavvidis, I. (2009). Movement hypothesis as a theoretical system for understanding educator ways to deal with data and correspondence innovations. *PCs and Education*, 53(2), 436–444. <http://dx.doi.org/10.1016/j.compedu.2009.03.003>
- Keengwe, J. and Onchwari, G. (2011). PC Technology Integration and Student Learning: Barriers and Promise. *Diary of Science Education and Technology*, 17, pp. 560-570. Accessible: <http://dx.doi.org/10.1007/s10956-008-9123-5>

- Kulik, J. A. (1994). Meta-scientific investigations of discoveries on PC based guidance. In E. L. Pastry specialist and H. F. O'Neil, Jr. (Eds.), *Technology evaluation in schooling and preparing* (pp. 9-33). Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc.
- Lemke, C., and Coughlin, E.C. (1998). *Innovation in American schools*. Accessible: www.mff.org/pnbs/ME158.pdf
- Lo" fstro" m, E., and Nevgi, A. (2008). College showing staffs' educational awarenessdisplayed through ICT-worked with instructing. *Intelligent Learning Environments*, 16(2), 101-116.
- McCarney, J. (2004). Successful models of staff improvement in ICT. *European Journal of Teacher Education*, 27(1), 61-72. <http://dx.doi.org/10.1080/0261976042000211801>
- Michiels, S.I. furthermore, Van Crowder, L. (2001) *Discovering the 'wizardry box': nearby allocation of data and correspondence innovations (ICTs)*. SDRE, FAO, Rome. Google Scholar
- Nikolopoulou, K., and Gialamas, V. (2013). Hindrances to the joining of PCs in youth settings: Teachers' discernments. *Educ Inf Technol*. <http://dx.doi.org/10.1007/s10639-013-9281-9>
- Nisar, M. W., Munir E. U. and Shafqat A. (2011). Use and Impact of ICT in Education Sector: A Study of Pakistan. *Australian Journal of Basic and Applied Sciences*, 5(12), pp. 578-583.
- Peeraer, J. and Petergem, P. (2011). ICT in Teacher Education in an Emerging Developing Country: Vietnam's Baseline Situation toward the Start of the Year of ICT. *Diary of Computers and Education*, 56, pp. 974-982. Accessible: <http://dx.doi.org/10.1016/j.compedu.2010.11.015>
- Pelgrum, W. J. (2001). Deterrents to the Integration of ICT in Education: Results from a Worldwide Educational Assessment. *PCs and Education*, 37, 163-78. [http://dx.doi.org/10.1016/S0360-1315\(01\)00045-8](http://dx.doi.org/10.1016/S0360-1315(01)00045-8)
- Peter Williams (2006) *Lessons from what's to come: ICT situations and the training of educators*, *Journal of Education for Teaching*, 31:4,319-339, DOI: 10.1080/02607470500280209
- Prestridge, S. (2012). The convictions behind the instructor that impacts their ICT rehearses. *PCs and Education*, 58(1), 449-458. <http://dx.doi.org/10.1016/j.compedu.2011.08.028>
- Public Assessment and Accreditation Council (NAAC), Bangalore, Karnataka, India, Retrieved from-www.naac.gov.in
- Public Board of Accreditation (NBA), India, Retrieved from - www.nbaind.org
- Public Council of Educational Research and Training (NCERT) , New Delhi, India, Retrieved from-ncert.nic.in

- Public Curriculum Framework (NCF) 2005, Retrieved from www.ncert.nic.in/rightside/joins/pdf/system/english/nf2005.pdf
- Public Policy for ICT in School Education (2012), Retrieved from http://mhrd.gov.in/locales/upload_files/mhrd/records/upload_document/revise_policy%20document%20ofICT.pdf
- Public Policy on Education, 1986, Retrieved from http://www.ncert.nic.in/oth_anoun/npe86.pdf
- Rashtriya Madhyamik Shiksha Abhiyan (RMSA), Retrieved from <http://mhrd.gov.in/rmsa>
- Rebecca, W. and Marshall, S. (2012). A New Face of Education: Bring Technology into the Classroom in the Developing World. *Worldwide Economy and Development*, Brookings. Sarkar, S. (2012). The Role of Information and Communication Technology (ICT) in Higher Education for the 21st Century. *The Science Probe*, Vol. 1, No. 1, pp. 30-40.
- Richardson, J. W. (2011) Challenges of Adopting the Use of Technology in Less Developed Countries: The Case of Cambodia. *Relative Education Review*, 55(1), 008-029.
- Salehi, H., and Salehi, Z. (2012). Difficulties for Using ICT in Education: Teachers' Insights. *Global Journal of e-Education, e-Business, e-Management and e-Learning*, 2(1), 40-43.
- State Council of Educational Research and Training (SCERT), NCERT, India
- Statistics Data 2011, office of the recorder general and registration chief, India, Retrieved from <http://censusindia.gov.in/2011-Common/CensusData2011.html>
- UNESCO Communique of the pastoral roundtable on 'Towards Knowledge Societies' (UNESCO, Paris, 2003)
- Wilson J.D. Notar Ch.C. Yunker B. Rudimentary in-administration educator's utilization of PCs in the rudimentary homeroom *Journal of Instructional Psychology* 2003 30 4 256 63 http://www.findarticles.com/p/articles/mi_m0FCG/is_4_30/ai_112686159
- Wood, E., Mueller, J., Willoughby, T., Specht, J., and Deyoung, T. (2005). Educators' discernments: boundaries and supports to utilizing innovation in the study hall. *Education, Communication and Information*, 5(2), 183-206
- Yusuf, M.O. (2005). Data and Communication Education: Analyzing the Nigerian National Policy for Information Technology. *Worldwide Education Journal*, Vol. 6, No. 3, pp. 316-321.