CAPACITY DEVELOPMENT OF TEACHER IN THE USE OF ICT

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Introduction:-

The rapid advances in information and communication technology (ICT) have had a profound impact on educational policies, contents, structure and methods of delivery throughout the world. They have greatly expanded learning opportunities for all age groups and have displayed a powerful potential as tools for teachers. Meanwhile, they pose new challenges to education communities for capacity-building and policy change in achieving Education for All (EFA) goals in new technology-facilitated learning environments in the emerging information society.

Development of Teachers/Facilitators in the Effective Use of ICTs for Improved Teaching and Learning focuses on the capacity-building of teachers in using ICTs to help them develop the necessary skills and knowledge of related pedagogies to enhance the teaching-learning process. Capacity building covers a number of aspects from training of teachers to support for content development. It highlights the critical issue that, without adequate capacity building, even well-designed policies and the most sophisticated technologies would not be able to achieve the desired results.

The objectives of capacity development:-

1 to improve the competencies of teachers and facilitators, through both pre-service education and in-service training, in integrating/infusing ICTs as pedagogical tools and educational resources to facilitate active student learning;

2 to identify create and disseminate country- and locally-specific ICT pedagogies and models of ICT use in different learning environments;

3 to develop and put into operation a regional online teacher resource base and offline network of teacher training institutions to share teacher-developed educational courseware and innovative practices.

To maximize the effect of ICT on knowledge and growth it is required to create maximum connectivity, adequate network capacity and minimum required infrastructure at each node.

Further, the diffusion of this process depends on the capacity of the human element to absorb and exploit the benefits of the technology. The policy framework and institutional mechanism coupled with the capacity to absorb and invest costs associated with both technology and human capacity building influences the role of ICT to support knowledge and growth.

The following sections examine the key aspects of capacity building for ICT in education in India on following critical components:-

• **Instruction-related aspects**

• **Institution-related aspects**

• **Investment-related aspects**

Capacity Building at the Instruction-Level: Capacity building of teachers and other education resource persons has two dimensions attached to it

 1) The pedagogical capacity building

2) The capacity building in using educational technology

Capacity Building of Teachers and Others:-

Capacity building of the people/manpower/teachers/instructors should not merely mean to enable the ability to use ICTs or "ICT Literacy." Though this is an essential prerequisite, it is rather trivial for a policy to be limited to this. The real meaning and power of ICTs for "capacity building" would be to enable the ability of the administrators, teacher and the student to use ICTs in their own processes of administration and teaching-learning in a manner they deem fit arising from their engagement with ICTs, facilitated by school administrators, teacher-educators, and teachers, respectively. Moreover, this would logically be components respectively within "school administration," or "teacher education" or "school education" itself. The key components of the capacity building of the teachers include a clear understanding and appreciation of the pre-service and in-service training institutions, their vision, coverage, the methodologies, and the extent to which their interventions are effective. The important point is that Capacity Building for ICT in Education once we start analyzing from these perspectives deriving from domain understanding and domain priorities, then possibilities such as collaborative networks among teachers, "decentralized curriculum preparation" itself as a teacher professional development process, distance-mode "on demand academic support" for teachers, asynchronous relationships possibilities across institutions and people, leveraging the capacities of ICTs, and so on, become apparent. However, another equally important use of ICT would be its use for the capacity building of teachers. The capacity building is not restricted to improving the ICT skills of the teachers but more importantly the intention is to exploit the potential of ICT to build the professional

competence of teachers, to develop their proficiency in classroom management practices, to enhance the quality of instructions, and others. Most of the countries in the South Asia region have realized the need for training teachers in ICT and have launched various professional development initiatives. However, many of these training activities to date focus mainly on computer literacy instead of enabling teachers to integrate ICT in their day-to-day teaching activities and master the use of ICT as an effective tool to improve teaching and learning. For the South Asian region, apart from the USESCO and other International agencies, there have been various Government initiatives and NGO activities in generating awareness and providing quality Training for ICT in education, for example: in India, various schemes and programs have been launched both at Government and non-governmental levels for almost two decades now for developing ICT skills in teachers to deploy technologies that enhance the quality of teaching and learning experience. Different universities in India have designed specific courses for this purpose. Organizations like the NCERT, UGC, NCTE, AIR, FTII, and soon have been launching schemes to enhance ICT skills of teachers, content developers, and so on.

 There are different teacher's training institutes offering Basic Training Certificate (BTC), Junior Basic Training (JBT), Diploma in Education (D.Ed), Primary teachers training (PTT), Bachelor in Education (B.Ed) and several other teachers' training certifications. Teachers with a higher professional qualification such as Master in Education or PhD were almost nil. Teachers' are also required to undergo in-service training to enhance the skills and update themselves with the new areas of teaching and learning

Some famous institution working for enhancement of teachers learning:-

Intel Teach to the Future Training Programme Intel- Teach to the Future is a worldwide education programme created for teachers to help them effectively integrate technology in the classroom to enhance student learning. The programme started in Karnataka on 25 June 2001 and trained one teacher from each of the Mahiti Sindhu schools as Master Trainers for a period of 13 days. These Master trainers were then supposed to train other teachers in their schools. So far, 8,000 teachers and head teachers from 1,000 Mahiti Sindhu schools and 400 teachers and head teachers from 76 higher primary schools have been trained under this programme.

National Indira Gandhi Open University- In 2002 IGNOU, a national government affiliated higher education institution started a two-year diploma course in primary education, and 9,000 teachers are currently enrolled in the course in Jharkhand. Teachers are not only given print material, but academic support is provided through pre-recorded programmes on

radio and TV six days a week. IGNOU makes the educational content for the programme itself. As AIR Ranchi does not reach all of Jharkhand, programmes are also broadcast from one AIR station in neighbouring Bihar. On Sundays there is a one-hour interactive question and answer session held over the telephone and teachers call in with their queries regarding the course. IGNOU also conducts workshops and school based modules to aid the teachers.

Capacity Building for Educational Content Development:-

Educational content is a key element of ICT use in education. It is basically the information that is offered to the intended beneficiary through telecenters, multimedia, or Web. The intended information may be textual, aural or visual, or a combination of them, and the importance of relevant content development can be easily accessed by the fact that any Web site or a community centre can draw interested groups only if information provided is useful to them, is passed to them in an interesting way, and is made user friendly. The most critical factors for the development of Digital Content to ensure its impact are:

• **Content Relevance**: Unless the intended beneficiaries do not find any potential benefit from the content, no initiative on ICT in education can ever be successful and self sustainable.

• **Content Availability**: The content that is generally available on the Internet is largely in English and is location independent. But in the South Asian countries (specifically in India), there is a varied literacy level and local language. Thus the availability of the right content targeting the general population but comprising different groups of end users is a huge challenge.

• **Content Research**: In the entire content delivery system the role of people who are involved right from development of content to presentation is very important. For instance, the mode of delivery of content depends on information that is required to be conveyed and the content needs to be developed accordingly. Thus, suitable training process needs to be evolved for the people who are entrusted with development so that better research practices are evolved for developing the content.

In India, The UGC e-content scheme aims at developing high-quality e-content, as well as expertise for generating such content over the long term. The scheme provides financial assistance and technical support to teachers and other experts based in colleges and universities for the development of e-content. The e-content development and associated Web-based learning described here does not seek to replace traditional teaching and learning, but is expected to supplement them. The goal of the UGC scheme is to encourage individual teachers, groups of teachers in colleges and universities and experts in the IT industry in

visualization and multimedia production to develop educational content, in electronic format, suitable for use in various teaching and learning programmes. This scheme is open to teachers in all subjects and disciplines.

Another Programme in India, the CoIL-Net programme3 by Department of Information Technology, Ministry of Communications and Information technology, is presently developing language-specific IT-based content (in Hindi), solutions and applications for the Hindi-speaking states of MP, Chhattisgarh, UP, Uttaranchal, Bihar, Jharkhand, and Rajasthan. The programme aims at the following for content development:

 • Develop Cultural Heritage Digital Library in Hindi

• Promote preparation and publication of IT Learning Material in Hindi

• Carry out content development, research, and its production through various existing mechanisms and methodologies

• Promote content digitization for promoting access and sharing of public sector information in Hindi • Develop methodologies for content delivery, aggregation, and management

 • Develop search engines, wizards, agents, and smart tags for rich media content management

 • Human resource development to carry forward the task of IT Localization

Capacity Building at the Institutional-Level:-

In addition to capacity building with respect to developing enabling infrastructure and equipping manpower/teachers and instructors, there is a definite need for interventions at the institutional level, especially through enabling of appropriate partnerships and collaborations. The most critical aspects of such partnerships and collations are the complementing capacities between the partners. Further, it should be appreciated in such context that the Government which plays the very vital role in the implementation of Capacity Building for ICT in Education, is constrained in finances, and therefore financing the reduction of the digital divide remains a major challenge. For the development of ICT in education sector, the role of Government spending in alignment with the development goals of the country is critical. Although the private sector has contributed significantly to the investments for building ICT infrastructure, operating ICT networks and delivering ICT services over the last decade and provided considerable financial resources, public sector funding plays an important role in creating a roadmap for development, enabling policy environment, channelling resources towards less commercially attractive regions as well as towards the poor, and supporting innovative financing mechanisms for ICTs for development. Several examples in many parts of the world have proven that such methods are applicable with

success. Local and collective financing of ICT projects, show large advantages in terms of ownership, initiatives, and so on. Microcredit exists since some years and it can have a significant contribution to successful implementation of ICT for development. Institutional capacity building also aims at developing adequate awareness on key ICT developments and opportunities within the local context, and thereby enables development of appropriate policies by the Government.

Capacity Building at the Investment-Level:-

At a first view, different technologies compete with each other and it is not yet visible, which one will finally be the best solution for a specific application. But a close look shows already that they will occupy different segments of the educational delivery and may finally be used in parallel. There is hope that the developing countries need not go through a "copper-age" but that they will directly start with wireless and satellite-based applications. Such prudency in decision making is enabled through the sharing and exchange of information on successful implementation and experiences of failures in implementing ICT for capacity building in education. The most important capacity needs at the investment level is the knowledge and awareness on the selection of the most appropriate technologies or the mix of appropriate technologies. For instance, Satellite radio exists for many years and is easy in use and accessible anywhere. Information and education programs are provided in the local languages and contribute significantly to the development of people. Satellite radio offers huge opportunities in the future. On the other hand, wireless mobile phones in the recent times are easily available and enable multifold advantage on enhanced educational transactions, as compared to the traditional ICT systems. Therefore it is well appreciated that there is a clear need for informed decision-making, which means, that the decision makers in the system needs to be made aware of the various ICTs available for use, and its' appropriateness with respect to the various local conditions and needs. As highlighted earlier, development requires the possibility of the developing countries to learn from the industrialized ones and to use the knowledge to adapt technology to their local needs and to follow subsequently their own development path. This learning and adapting is only possible if the knowledge is actually accessible and can be further processed. There were claims for open software because this is the prerequisite to enable people fro

ACCESS TO ICT DEPENDS ON THREE BASIC PREREQUISITE:-

- **INFRASTRUCTURE**
- **FINANACIAL RESOUCRE**

- **LEGAL FRAMEWORK**

Some of the key issues and concerns are discussed as follows:-

1. **Increase in the use of ICT in education has not occurred at the same pace as that of the increase in overall ICT infrastructure and, the overall increase in ICT availability has not yet reached a stage of providing access to most people in South Asia-**

We have seen a surge of ICTs such as telephone lines, mobile telephone, Internet and availability of computers over the last decade. However, the scaling up of ICT in education has not occurred at the same rate. There are several reasons for this divide in application of technology.

First: infrastructure like electricity access, telecommunication, and so on, and capabilities such as content development have not taken off as rapidly as the technology itself.

Second: penetration of these technologies is still limited to a few people mostly economically higher classes. For example, we have observed the rise in the internet users but the use of internet to social issues is still not there like use of internet in education and health.

2**. Absence of integration and interaction restricts sharing of information resources and mandates duplication of efforts, resulting in ineffective utilization of ICT-** There are relatively few available platforms for sharing best practices and resources at a regional level in South Asia. For example, the University Grants Commission has a network of over 17 Educational Media Research Centers and Audio Visual Research Centres. The National Open University and Indira Gandhi Open University (IGNOU) have the capabilities of providing education through alternative modes. Thus, each nation has a number of institutions which do not interact with each other within the nations and their counterpart in the region. Thus, interconnected networks of these institutions with the country can provide a great opportunity for the regional networks on education which can use and share resources such as education content, media and other resources

National Open School- The National Open School (NOS) India was established in 1989 to support India's National Policy on Education. The school caters to the needs of school children as well as children from socially marginalized communities in both urban and rural locations. While the school's early focus was on academic programs at the secondary school level, it currently offers courses in vocational and other life-skills areas. It also has extended its range from elementary to pre-university programs. Some 400,000 children are enrolled,

and they come from challenged communities, socially disadvantaged groups, and isolated populations. The school uses ICTs for course development, administration, testing, and to deliver some content by audio and local radio. Its plans for the future include even more extensive use of the newer technologies through tele- and community-learning centres.

3) **Absence of trained teachers of high quality and calibre poses a greater challenge-**

Teachers are "live" infrastructure and the quality of teachers defines the quality of instructions that in turn defines the education outcomes. The country has severe deficit of trained teachers and also robust training infrastructure and its linkages with broader pedagogical reforms. At the same time introduction and gaining importance of ICT in education poses new demands on part of ICT capacity building of teachers.

4**. Restrictive access to ICT facilities results in a lack of ICT enablement-** Many schools that have computers provide only partial access to the children during lab hours or to learn computer as a subject only.

5. **Absence of authentic and adequate data restricts appropriate policy formulation and undermines impact-**

Despite increase in availability of technology and interconnected infrastructure and many focused initiatives, availability of data on wide-ranging education indicators is still an issue in South Asia. Availability of data on education is uneven There is an urgent need to gather information on wide-ranging attributes related to infrastructure, capacity building and in particular use of education technology. Also, the linkage of such data to the policy formulation is the key to achieve the long-term objectives of improving education outcomes and its relation to the growth of knowledge

6. Narrow focused targeted interventions limit the overall gain from ICT and miss the broader vision and goals of the sector-

There are many successful initiatives and many models that have worked in education technology in South Asia both driven by Government and non-government organizations. The Governments have tried to address the basic issues such as access to education or spreading the reach of education to all and improving facilities at ground level through targeted programs. There are many initiatives being taken by the Governments and non-government organization, which do not take note of the other programs. The need for an ICT in education policy has emerged only recently in the region. There are various programme involve: improving access and availability of infrastructure, such as classrooms and computers, and teacher's training.

7. Continued need for a minimal level of physical and complementary infrastructure -

ICT has helped removing many barriers in education such as physical presence of the educator and the learner at the same place and at the same time. Also, with the availability of improved mobile and wireless technology, requirements for fixed physical communication infrastructure can be ignored in the developing country context. However, to achieve the goals of "education for all" there is a dying need to provide minimum level of physical infrastructure and also upgrade existing school buildings and rooms in developing country.

8. Low utilization of ICTs potential-

It is essential to ensure supply of adequate hardware to schools, availability of adequate uninterrupted power supply and qualified ICT-conversant teachers. However, there is a need to shift focus among policy planners, budget allocations and program design to ensure that ICT in education does not stop merely at providing these facilities. In turn it turns out to be an ironical paradox where computers are being used to monitor how many computers are installed in how many schools! The actual fruits of ICT in education can only be realized by designing and supporting a parallel pool of education technology-enabled content and ability to use it as a tool in actual teaching and learning. ICT in administration should grow beyond basic monitoring of progress to a scientific monitoring and evaluation system which could provide a wide range of inputs for education policy and indicators for monitoring outcome achievement.

MEASURMENT FOR IMPROVING ICT IN EDUCATION:-

Development of technology savvy teachers-There is widespread need to impart excitement and relevance to the teaching-learning process so that the young men and women can contribute to, as well as benefit from, the socioeconomic progress. Rapid proliferation of ICT needs to be exploited for assisting a teacher to assimilate the art, science and technology of teaching. Simultaneously, creative teachers have to be recognized with morale-boosting rewards and awards so that they become a role model. The focus should be on design of multimedia modules, borderless training strategy and providing pre-service and in-service ICT training for teachers with the help of ICT-based resource packages designed by teachers for teachers under professional guidance and supervision. The objective of such training program should be to provide hands-on ICT learning opportunity for teachers to become more comfortable with technology, incorporating the Internet, Webpage design, and project-based approaches to support training model.

Improve real-time instructional support available to teachers who use technology-With a small number of teachers catering to vast population it is not a wise idea to displace them from their work places. It not only allows the work places to suffer but also troubles the

teachers who are low paid employees. This is precisely the reason why our full-time teachers training programmes are a failure. The teachers' training at their work places can be effectively carried out through ICT networks .It will also enable us to take instantaneous feedback from field locations without any hassle. High-quality, comprehensive instructional support is critical in assisting teachers to integrate technology into their instruction. Such support may include the availability of just-in-time individualized training and professional development activities, with content that focuses on supporting teachers to integrate the technology available to them into their instruction. Technology coordinators also play a critical role in fostering the effective use of technology in schools through their knowledge of both technical and instructional issues. Strategies include

• Countries within the region, states and districts within the country, and content associations and organizations, and private sector organizations should develop online resources to provide just-in-time support to teachers. Specific examples include education focused portal sites for teachers, which offer online communities for professional development or mentoring, tools for classroom management and administrative tasks, and tools to facilitate increased communication with parents and community members;

• Educational technology organizations should consider developing national standards and certification programmes for technology support professionals and programmes;

• Provincial Government, districts, and schools should develop comprehensive technology support programmes, directed by qualified technology coordinators at each school building;

• Countries within the region, states, districts and schools should investigate on emerging approaches to providing technical and instructional support over the Internet by building, using, or purchasing teacher-specific resources online

Introduce ICT Proficiency in Certification and Selection of Teacher:-

Proficiency in applications should be considered as one of the important criteria for teacher's qualification and their selection. Therefore, necessary steps should be taken at the Government and Sector-levels to notify such regime and ensure introduction of relevant courses by the TTIs:

• Facilitate liberal and easy loan facility for purchase of broadband Internet and PC by teachers and students in collaboration of Banks and so on.

• Facilitate concessional broadband connection and PC to the teachers and students in collaboration with industry.

• Provide income tax exemption on amounts spent on Internet connection and purchase of PC to students and teachers.