

**ROLE OF ICT IN TEACHER EDUCATION**

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**ABSTRACT**

*The author asserts that teacher education system empowered by ICT-driven infrastructure can have a great opportunity to come up to the center stage and ensure academic excellence, quality instruction and leadership in a knowledge-based society.*

*Knowledge is the most J. JL democratic source of power.*

*-Alvin Toffler*

*This paper is a description of an in-service teacher training experience that used ICT to develop a project that involved teachers (nursery and primary) and also children, parents and other members of the educational community. Its aim was to build an Internet site that would give information about school life. It's an open web space where teachers, parents and students can express and share their ideals and activities. This project is still in progress and is being developed in three interconnected phases: conception, development and evaluation. The most important issue to relate is that the technical or instrumental learning is dependent on the ideas and purposes of teachers, students and parents.*

*We believe that when we talk about ICT in schools and also in teacher education we shouldn't only be concerned with the 'means', that is to say, how to introduce computers or how to use a word processor and Internet resources, but also with the 'ends'.*

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## INTRODUCTION

Teacher is considered to be the architect of the nation. In other words, the future of the nation lies in the hands of teacher. This shows the importance of teacher. One can realize how important education is which makes one a teacher. Teacher education is looked after by a systematic operation of various agencies involved in it. In our country, no system is free from problems; teacher education is not an exception to it.

Various education commissions and a number of expert committee have discussed the aims of teacher education in India. Unfortunately, barring a few exceptions, our universities and institutions of higher learning have largely not been able to live up to these great expectations. On the contrary, they have just become bodies for conducting stereotyped examinations and degree-awarding centers. The quality and reliability of such exams and degrees is also sometimes questionable. One of the main reasons is the inadequate academic, professional and pedagogic preparation and insufficient level of knowledge and the skills of the faculty. Besides this, traditional versus modern methods of teaching, outdated knowledge and information and lack of skills, teachers attitude, aptitude and authenticity of their sources of knowledge are some of the other core issues. Owing to knowledge explosion and tremendously fast changing ICT, the teachers sometimes find it rather difficult to cope with the new intellectual challenges being thrown up by the changed global and local context. Therefore, they need to acquire new knowledge, and reliable and authentic information.

In present scenario, teachers need to help their students in: how to learn, how to grow in future, how to develop study skills, how to conduct fundamental research, how to examine, evaluate and assess information and also how to question and then dismantle unauthentic structure of knowledge and cognition if need be. This is necessary if the teachers really want to survive in the ICT savvy world of education. All these expectations may be met only through need-based, goal-oriented and meaningful in-house discussion, conferences, symposia, workshops, refresher and orientation courses, crash courses, capsule courses and subject-based courses, interdisciplinary and holistic approaches to education and quality research and by enriching the existing libraries and making use of the user-friendly ICT with contextually appropriate and firm pedagogical scaffolding. The teacher educators and individual teacher ought to sincerely and persistently work hard toward this goal.

According to Verma (2010), a teacher plays a significant role not only in class teaching learning situation but in social engineering too. Society gives a respectable place to teachers

who are really perspective empowered. This empowerment is not at in terms of physical perspective. It is in academic, intellectual, social, and national perspectives.

In India as in rest of the world phenomenal changes are taking place in almost all walks of individual, social and national life at fast track. Since education plays a pivotal role in liberation of individuals from ignorance, exploitation and poverty and makes the nation enlightened, prosperous and empowered, it has to respond to the demand of the changing times to retain its relevance and effectiveness.

Planed change in education with an overall qualitative improvement can be instrumental in achieving the target of a better and a higher quality of life. This change in education scenario would rest on the academic acumen chiseled professionalism and unshakable commitment of teachers and teacher educators working in perfect consonance with educational planners and managers. Their vision, zeal imagination and creativity have to be continuously supported by fresh academic enrichment and research based pedagogic innovations.

Generally in the societies, the status of teachers holds a very high position because the teachers is the only person on whose shoulders lies the burden of the development of the younger generation. Secondary Education Commission has rightly stated “we are however convinced that the most important factor in the contemplated reconstruction is the teachers, his personal, his educational qualifications, his professional training and the place that the occupies in the school as well as in the community. The reputation of a school and its influence on the life of the community invariably depended on the kind of teachers working in it.

## **ICT AND TEACHER EDUCATION**

There are a variety of approaches to professional development of teachers in the context of use of ICT in education. Professional development to incorporate ICT into teaching and learning is an ongoing process and should not be thought of as one ‘injection’ of training. Teachers need to update their knowledge and skills as the school curriculum and technologies change. Two aims of teacher training are fundamental: teacher education in ICT; and teacher education through ICT.

## **ICT - A SOLUTION FOR THE IMPROVEMENT OF THE EXPERTISE OF TEACHER**

ICT enabled distance education is poised to rule the world. This would not only strengthen the elementary education needs of the country but would also increase the dependence of education on ICT. Technological development always warrants transition to newer

technologies by jeopardizing the cost effectiveness of the distance education programmes. Retaining the already existing technologies for a considerable period of time and subsequently embracing new technologies should have fine balancing, so as to improve also the quality of education. India is one among the few countries in the world, which has not allowed the expenditure on education to shrink over the years. The increase in expenditure on elementary education alone over the last four Five Year Plan periods has been more than the increase in expenditure on education as a whole. With all the inputs around, there is only hope for enhancing the quality of education at the elementary stage.

### **Role of Teacher in Enhancing Learning Achievement of Child**

Education, as we know is instrumental in ensuring that the future generation is well informed and competent. Unfortunately, because the quality and accessibility of education varies so greatly between regions, the school system of our country often fails to deliver the level of education necessary to ensure such competency. Many schools have limited resources for buying books, stationery, furniture and other classroom materials. Teachers lack adequate qualification and training to engage their students in learning. Their lesson plans are most often outdated or irrelevant. These jeopardize the available quality of education. ICT enabled distance education, to a great extent, can combat this problem. Because the present day distance learning is ICT-enabled, most of the programmes include computer and Internet training to facilitate the use of essential technology. The acquisition of fundamental ICT skills among teachers and students helps knowledge sharing, thereby multiplying educational opportunities. However, all teachers are not willing to introduce new technologies to themselves first and subsequently to their students. In order to implement ICT-driven distance education programmes, the teachers must first understand and be comfortable with the technologies. They must be given opportunities for acquisition of a new knowledge. This can begin by promoting computer-training programmes for teachers. Monetary incentives can be offered as means of motivation. The use of ICT can effectively enhance learning where traditional models have failed. While these technologies offer advantages, they also pose challenges. Several studies have been conducted in the west about the use of ICT in Middle and High School students. One such study is by Martin Carnoy<sup>14</sup> which is entitled- Education: Possibilities and Challenges-2004-05 Academic Year. According to him, 'Using ICT as a supplement to improve test score results, may, however, be seen to be more effective than traditional teaching one, hence is much more applied.' He also comments about the use of ICT for teacher and administrator training. 'Private firms such as Sylvan quickly

saw the potential of ICT as an in-service training medium for teachers, and this now forms an important part of Sylvan's extensive ICT learning systems... An entirely different approach to teacher improvement is web access to course content, lesson plans and network to other teachers. This database or content, approach is used by Net Schools and the IBM foundation. Both these organizations focus on using ICT as teacher training for course content rather than improving pedagogy.'(UNESCO) It can be seen that Distance Learning Technologies have been employed in the education of teachers both at preserves level and at the in-service level. UNESCO has published a summary of case studies conducted in nine countries in different parts of world and most of these studies reflect the necessity of having multi-prong strategies for teacher education and to improve their expertise. For example, 'in China television has been tremendously used for teacher education. In India, there is a multimedia approach for teacher education. In UK, due to heavy shortage of teachers of Mathematics and Science, the Department of Education invited tenders...the Open University was successful in this and the result was Open University's Post Graduate Certificate of Education (PGCE) programmes, where ICT plays a large role in enabling interaction between students, tutors, regional support centers and programmes providers '.

### **ROLE OF ICT TO ELEVATE TEACHERS EDUCATION**

In almost all sectors of education the role of the teachers is changing from being not only a transmitter of knowledge but also that of facilitator of the teaching-learning process. Owing the onset of information and communication technology (ICT). New applications of technology and enhanced accessibility to it are introducing new possibilities of teaching and learning. The traditional boundaries of the classroom are giving way to virtual learning and online courses. All these development would have profound impact on teacher education programmes and processes.

This technology invites learners to be more independent and the curricula to be more dynamic. Teachers need to complement their content and pedagogy expertise by utilizing online facilities. Use of ICT effectively requires a change in classroom practice rather than mere acquisition of technical skills. Teachers need to familiarize themselves with possibilities approaches and application in the use of ICT, the facilitation of teaching learning. These technologies along with overhead protector and computer projections have the potential to make teaching. Learning and training processes more efficient and cost effective. It has opened up new possibilities of reaching out to the still un-reached disadvantaged groups and children with special needs.

The educational channels need to be organized, strengthened and utilized for creating awareness strengthened, and utilized for creating awareness, providing instructions and offering solutions of problems faced by learners of specific age. The increasing use of technologies has brought changes in the modes and methods of instructional processes which are becoming more learner-centered. New interactive relationships among teachers, learners and technologies are emerging

Teacher education programs at the pre-service and in-service levels must have ample scope for inducting pedagogic skills and management of technologies as important components of teaching learning environment to enhance efficacy to transaction. These need to integrate teaching-related practices with the existing methodology course and introduce specialized course to equip the student teachers with skills to operating and maintaining hardware, acquiring and utilizing software of different kinds i.e. structured textual materials, teaching aids, audio-visual cassettes, multimedia, CD ROMs and sharing information through networking in collaborative and participative methods. The application of ICT in the education setting has to be cultivated, promoted and nurtured.

Teacher educators have to develop new understanding approaches and attitudes in harmony with new developments in information technology. Their proficiency in these areas would help them to train student teachers effectively. Teacher's education institutions will have a take leadership in using information technology.

As technology has created change in all aspects to society, it is also changing our expectations of what student must learn in order to function in the new world economy. Students will have to learn to navigate through large amounts of information, to analyze to make decisions and to master new knowledge domains in an increasingly technological society. They will need to be lifelong learners, collaborating with others in accomplishment complex task, and effectively using different systems for representing and communication knowledge to other. A shift from teacher centered instruction to learner centered instruction is needed to enable students to acquire the new 21<sup>st</sup> century knowledge and skills.

Paradigm shift through ICT in teacher Education.

1. Teacher centric, stable designs learner-centre, flexible designs
2. Teachers direction & decisions Learner autonomy
3. Passive reception in learning active participation in learning
4. Learning within the four walls learning in the wider social of classroom context
5. Knowledge as given and fixed knowledge as it evolves & is
6. Disciplinary focus

#### 7. Liner exposure Multiple & divergent exposure

The 21<sup>st</sup> century teachers and student require the lenses of learning form ICT with ICT around ICT with the skills of

1. Digital are literacy Basic, Scientific, and technological literacy.
2. Inventive Thinking Intellectual capital ability of manage complexity courtesy.
3. Effective communication-social and personal skills-Teaming collaborative and interpersonal skills.

## **ROLE OF ICT AT DIFFERENT LEVELS OF TEACHER EDUCATION**

### **Role of ICT at Primary Level**

The programmed of primary education is to be designed carefully to provide for an all round. Wholesome growth and development of the children including their new muscular coordination, self-expression, observation skills, health and hygiene and habit formation.

To help primary teacher education centers do their work effectively establishment of learning resource center in a teacher education instruction has to be mandatory. Such a center may be equipped with picture books audio-video tapes slide showing picture of animals, insects, birds, flowers vegetable, fruits. ICT is gradually emerging as an integral part of teacher education at primary level. It influences not only teaching system but also the learning styles. ICT results in transformation from teachers oriented learning to that of exploratory self learning.

### **Role of ICT at Secondary Level**

Secondary education is the link between primary and higher stage of education and occupies a crucial position in a system of education because general education terminates here and the students at this level prepare for making choices through appropriate diversification of course

*To achieve these objective*

ICI helps to make multiple innovative and interaction modes adopted for transmission of foundation restated papers and internship in teaching.

Making of different programmed instruction programmes.

Use of ICT as vital modes of transaction

Methods of teaching would involve use of pedagogical analysis, ICT, new evaluation techniques.

## **ROLE OF ICT AT HIGHER LEVEL**

It occupies a unique position in the system of education. As teacher education systems exist today, there are pre-service teacher education programmers for preparing teachers at primary and secondary stages. There is no provision however is prepare teacher for higher stage.

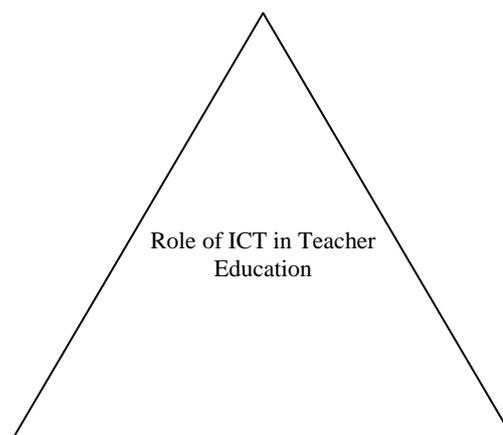
Role of ICT to elevate teacher in at higher education to empowering teachers for self-study, reference political thinking, abstract thinking, and of knowledge by adopting various such as project work, acquire skills.

### **Role of ICT In-Service Teachers Education**

Main objective of in-service teacher education is to enable the teacher to would the assumptions underlying existing national policy curricula and syllabi. In of new educational developments improvements in evaluation as new research proposal must take

### **Preservation**

Anything Materials, printers, Books



### **Transmission Development**

Radio, education collection & analysis of data education computer, internet accesses, online discussions. TD is the application in the education long with which the teaching process dually mechanized so that maximum they be educated in minimum time and

### **Table Showing The Paradigm Shift Through ICT**

Teacher educators and teachers education institutions should help the student teachers to grow along with the present technological modifications.

S. No.	Different Teacher Education Stage	Objective	Role of ICT
1.	At Primary level	All round development new observational skills. Habit formation.	Establishment learning resource center “equipped with audio with audio-visual material like T.V.VCR side projectors of animals fruits insects flowers.
2.	At secondary level	Integrated & holistic approach; inculcating social cultural aesthetic. Moral & scientific values responsive & transparent evaluation	Multicultural setting, training of cooperation among teachers. Skill training in undertaking action research online conference. Seminars & expert discussions
3.	At higher level	Empowering teachers to guide learning for self study, reference skills, critical thinking adopting various methods such as project work & tutorials. Research attitude.	Electronic information resources E-journals. E-conferences. Bulletin board services. Global classroom. E-libraries
4.	At in services training level	To know existing educational policies curricula & syllabi skills for effective transaction of curriculum. New educational development	Audio-video teleconferencing. Connectively with the concerned agencies like. NCERT SCERT NCTE UGC, CABE. Etc. Training of computer & higher learning opportunities though correspondence.

## CONCLUSION

The teacher education system empowered by ICT driven infrastructure can have a great opportunity to come up to the centre stage and ensure academic excellence, quality instruction and leadership in a knowledge-based a society.

Rapid changes in technology will ensure that ICT will proliferate in the classroom. It is predicted that there will be many benefits for both the learner and the teacher, including the promotion of shared working space and resources, better access to information, the promotion of collaborative learning and radical new ways of teaching and learning. ICT will also require a modification of the role of the teacher, who in addition to classroom teaching, will have other skills and responsibilities. Many will become specialists in the use of distributed learning techniques, the design and development of shared working spaces and resources, and virtual guides for students who use electronic media. Ultimately, the use of ICT will enhance the learning experiences for children, helping them to think and communicate creatively. ICT will also prepare our children for successful lives and careers in an increasingly technological world.

ICT has revolutionized the entire concept of education, learning and research by offering new opportunities and challenges in creation and dissemination of information by way of Web TV's, Net PC's and Web-based education independent of time, pace and place. It is really a challenging task to strengthen ICT in teacher education because a large majority of the teacher education institutions are unequipped or under-equipped in the terms of digitized and high-tech infrastructure.

## REFERENCES

1. Ahmed, S. and Singh, M. (2010) Multimedia in Teacher Education Empowering Accessible, Flexible and innovative learning, Shikshak - Shiksha Shodh Patrika Vol. (04) No (1) pp. 32-33.
2. All India Association of teacher, colleges (1964) the improvement of Teachers Education Washington DC.
3. Ashton, P. (1985). Motivation and The Teacher's Sense of Efficacy. In C. Ames, and R. Ames (Eds.), Research on motivation in education, 2, pp. 141-171. Orlando, FL: Academic Press Inc.
4. Asian Institute for teachers Education Identification of Technical skills of Teaching and Development of Training Materials Together with suggestions Fro development of a Model of analyzing A Classroom (1972)

5. Bandalos, D. and Benson, J.(1990). "Testing the factor structure invariance of a computer attitude scale over two grouping conditions", *Educational Psychology Measurement*, 50, pp. 49-60.
6. Bandura, A. (1982). "Self-efficacy Mechanisms in Human Agency. *American Psychologist*", 37, pp. 122-147.
7. Barr, A.S. (1958) *Characteristics of Successful Teachers* Phi Phi. Delta Kappa.
8. Fay, A. & Mayer, R. (1994). *Benefits of Teaching Design Skills before Teaching Logo Computer Programming: Evidence for Syntax-Independent Learning. Journal of Educational Computing Research*, 11 (3), pp. 187-210.
9. Ferguson, D. L. (1992). *Computers in Teaching and Learning: An Interpretation of Current Practices and Suggestions for Future Directions*. In E. Scalon & T.O'Shea (Eds.), *New Directions in Educational Technology*. Germany: Springer-Verlag/NATO ASI Series, Series F: Computers and Systems Sciences, 96, pp. 33-50.
10. Gatewood, T. E., & Conrad, S. H. (1997). *Is your school's technology up-to-date? A practical guide for assessing technology in elementary schools. Childhood Education*, 73(4): pp. 249-251.
11. Gagne, N.L. (1968) "Hand Book of Teaching "Rand Mac Nalley Co. New York
12. Hillard. F.H. (1971) *Teaching The teachers* London. George Allen Unwin Ltd.
  
13. Hall, A. K. (1982). *Computer - based Education*. In H. E. Mitzel et al. (Eds.), *Encyclopaedia of Educational Research*. New York: The Free Press, 5<sup>th</sup> Edition: pp. 353-367.
14. Kothari. D.S. "Education Commission (1964-1966) Ministry of Equation, new Delhi.
15. *National Curriculum Framework 2005*.
16. Paliwal A.K. (2006).*Faculty development in teacher education perceptions and changing context, sovinier 7th National conference MATE pp 10-11*.
17. Reed, W.M., & Overbaugh, R.C. (1993). *The effects of prior experience and instructional format on teacher education students' computer anxiety and performance. Computers in the Schools*, 9(2/3), pp. 75-89.
18. Rohner, D. J., & Simonson, M. R. (1981). *Development of an index of computer anxiety*. Paper presented at the annual convention of the Association of Educational Communications and Technology, Philadelphia, PA.

19. Russon, A. E., Josefowitz, N., & Edmonds, C. V. (1994). Making computer instruction accessible: Familiar analogies for female novices. *Computers in Human Behavior*, 10(2), pp. 175-187.
20. Schunk, D. H. (1981). Modeling and Attributional Effects on Children's Achievement: A Self-Efficacy Analysis. *Journal of Educational Psychology*, 73, pp. 93-105.
21. Torkzadeh, G. and Koufteros, X.(1994). Factor validity of a computer self-efficacy scale and the impact of computer training. *Educational and Psychological Measurement*, 54(3), pp. 813-821.
22. Takwal, R. (2003) Problems and Issues faced by Indian Education system UGC Golden Jubilee Lecture series. pp.5.
23. Venna S.K (2010) Teacher Education some qualitative consideration, *Shikshak - Shiksha Shodh Patrika*, 4 (1), pp. 10.
24. Woodrow, J. (1990) Locus of Control and student teacher computer attitudes. *Computers Education*, 14, 4, pp. 421-432
25. Woodrow, J. E. J. (1992). The influence of programming training on the computer literacy and attitudes of preservice teachers. *Journal of Research on Computing in Education*, 25(2), pp. 200-219.