

**Role of Teacher in Enhancing
Learning Achievement of Child
&
Emphasis on Teacher Skill Development, Knowledge
Building and ICT**

By

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Introduction

The role of education in improving the choice and quality of lives, enhancing social and economic productivity, and initiating the process of empowerment and redistribution of resources is well-documented in the past fifty eight years of research. Despite India's commitment to provide "free and compulsory education for all children until they complete the age of 14" and achieve Universalization of Elementary Education (UEE) and Millennium Development Goal (MDG) with substantial improvement in the quality, the average years of schooling has remained low at less than three years. Around 35 million children, in the age group of 6 to 14 years, are still estimated to be out of school and the percentage of girls and other disadvantaged sections is disproportionately high among these children. Various state sponsored efforts at national, state and district levels are currently underway across India, aiming at accelerating the pace of UEE and MDG. In some areas, notable small-scale initiatives by non-governmental organizations and other representatives of civil society are complementing state-sponsored efforts.

There has been a growing realization that a system-wide transformation is crucial for the attainment and sustainability of the goal of UEE and MDG with improved quality. The objectives of improved access and increased participation, reduced drop-out rates and enhanced learning achievements cannot be met and sustained without improving the quality, effectiveness and efficiency of services in the elementary education system. The organizational structures, processes and practices determine the effectiveness of the whole system to a large extent, including the delivery of the final output and achievement of the ultimate goals. Some of the initiatives that are underway specifically focus on development of academic as well as management processes, and intend to function as catalysts and harbingers of this systemic change.

There is a need to take stock of the critical managerial and accountability issues in elementary education in order to consolidate the achievements, identify the gaps and set future goals. Some initiatives have already been implemented in the past and there is sporadic evidence of institutional reforms having been initiated in some states. However, the available literature appears to be limited either to the activities and interventions undertaken by the project/programmes, or isolated examples in some areas. Even the interventions and processes initiated by these programmes, or other small initiatives, have rarely been assessed from the point of view of a system-wide transformation. Therefore, a fresh assessment of existing role and responsibility of teacher in the context of class room management, in elementary education as a whole, was considered necessary to determine the future course of action to achieve the goals of UEE and MDG, and raise levels of systemic effectiveness. In addition, a number of other measures initiated in other sectors, like Local Self Government and Rural Development, have had a direct impact on elementary education management, and the last few years have witnessed rapid changes in this respect. Any effort to understand and review the elementary education system must take note of this fact as well. (Jha, Baxi, and Saxena, 2001).

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Objectives of the paper

This paper aims to understand the existing elementary education system through the structures and processes as they exist currently, and how the teachers are playing a role in improving the learning achievement in overall school management. The specific objectives of the paper are outlined below:

- (i) to take stock of the administrative and management processes undertaken by the teacher in the class room, as well as practices and processes within organizations,
- (ii) to assess and reflect on the effectiveness and efficiency of the management and administration of elementary education,
- (iii) to identify critical issues which need to be addressed, in order to enhance effectiveness and efficiency in student learning, with particular reference to the need for teacher development and provide solutions to enhance their efficiency
- (iv) to take stock of current training module for the teacher training and identify demand-supply gap in terms of skill development like information, communication and technology (ICT) and capacity building in the knowledge management process.

Role of Teacher in school management to enhance learning

India has one of the largest networks of schools in the world. During the last five decades the system has grown manifold in size both in terms of institutions and enrolment. Some say, that the nature of Indian education system shifted from an elite system to a system of mass education. For instance, the number of primary schools was around 200,000 in 1950, which is at present more than 600,000. If one were to take into consideration the number of alternate schools that have sprung up in recent years, and include the upper primary and secondary schools, the network consists of more than a million schools.

Traditionally, school education acquired immense importance in the post-Independence period and with the consequent expansion of the system, the role of the school teacher also underwent a significant transformation. An important consequence of the expanding system of schools, with ever increasing enrolment and acquiring of mass character, has been the increase in complexity of school management. The changing pace of technology development like ICT and knowledge revolution has made the job of the teacher more demanding. They are required and should be encouraged to assume the new roles and responsibilities for ICT to improve the quality of education and access to education by learners in an informal and non-formal education setting. (Govinda, 2002)

The system demands new knowledge and skills from the teacher and head teachers. It also demands greater capability at the school level to respond to the emerging diversity in the student population and among those entering the teaching profession. In effect, changes in the characteristics of the system have made the role of the school teacher even more critical than what it was earlier. Has the State, which is the main provider of education in the country, responded to the changed reality? Has the teacher become more empowered? Have adequate efforts been made to equip the teacher to face the emerging challenges? What is the current reality with respect to status, roles and functions of the teacher and the head teachers in India? And how can we come out from this challenge? These are few issues which need attention especially now when the country is moving towards becoming a knowledge centre and quality education has become determinate in such process.

An overview of teacher managerial function in the class room

Historically, most of teachers restricted their role to teaching. The different government organizations and departments provided a guide line for the role and responsibility of the teacher. The teacher plays multiple roles in the school. The role of teacher is assessed in terms of his/her attendance in the class, completion of the course and interpersonal relation in the school. Till now, hardly any indicator is developed to assess the performance of teacher on the basis of learning achievement of the student.

The critical managerial functions of a teacher in elementary education are similar to those in other sectors. These are:

- (i) Administration. Administration refers to the direction, control, management and organization of human and material resources for educational growth and development.
- (ii) Personnel management. Planning and managing human resources is personnel management. It includes recruitment, transfer and redeployment; promotional opportunities and performance appraisal systems, grievance redressal mechanisms and professional development issues.
- (iii) Planning. Planning is a systematic exercise of determining a future course of action in accordance with identified objectives, needs, priorities and existing/likely capacities, within a given time frame, reflecting cost-effective choices.
- (iv) Financial management. Financial management refers to mobilization, deployment and efficient use of financial resources as per stated objectives and strategies.
- (v) Supervision, monitoring and support. Monitoring and facilitation of teaching-learning processes, and other school development activities, for enhancing their quality through suitable tools, methods and mechanisms. The focus is on school, because this is the unit where primary learning takes place, and any effort to improve the quality of processes should ultimately be reflected here.

- (vi) Information management and communication. Management of information as an institutional resource is "Information Management". It includes aspects of collection, processing, dissemination and use of information. "Communication" refers to the process of exchange of information and feedback.

Management processes are not always clearly defined and are applied in unambiguous terms. It is common to come across a varied understanding of the same function by different organizations/units/ persons in the same sector. The perception also depends, to a large extent, on the way the particular organization/unit/person handles the function at its level. This study has tried to understand and assess the processes against commonly defined functions. The processes have been defined from the perspective of quality, effectiveness and efficiency. The stakeholders' perspective is also in-built in these definitions.

Unlike business operations, where standardized procedures based on uniform interpretations of guiding principles are more common, the guiding principles of management functions in education could be interpreted effectively in more than one way. The strength of a particular choice for a process in educational management also lies in whether the sequence brings about a change in totality as well as at different steps. The effectiveness is, thus, linked not only to the quality of output/ outcome, but also to the quality and impact of individual activities.

Who becomes a teacher?

Typically, the posts of teachers are recruited at three levels - primary, upper primary/middle and secondary, but there is no uniformity in this regard. Also, the number of teachers in a school invariably depends on the total enrolment and the number of grades in the class. Generally, a 12th pass with a two-year training at the District Institute of Education and Training (DIET) becomes eligible for the post of a primary school teacher. A person with a graduate degree and B.Ed training becomes eligible for the post of a secondary school teacher.

These are the general standards prescribed and recommended by the National Council of Teacher Education (NCTE) also. However, empirical analyses showed that there were wide variations in the qualification levels of the teachers. Apart from this, under a different scheme a local teacher with minimum qualification can also be recruited at the primary level. They are called para teachers.

Place of the teacher in the Education Management Set-up

While decentralization and community empowerment as rhetoric continue to consider the role of the teacher in school management as critical, the ground reality is altogether different. The place of the government primary school teacher is invariably at the lowest rung in the official hierarchy, and commands practically no authority even within the school.

The teacher is directly responsible for the learning achievement of the student; he or she may never assess the learning achievement of the student. In many states, a specified proportion of teachers are recruited directly as 'para teachers', though a majority of the appointees would be from the local area. The directly recruited teachers, who would have a greater opportunity to enhance the learning of the child, are engaged in a different activity rather than teaching.

An emerging factor that is likely to change social perceptions about the place of teachers in a significant manner is the move to implement right to information and effective Management Information System (MIS). This in effect may make the teacher more accountable and improve their status within the system. Instead, apprehensions were expressed in some quarters that knowledge revolution and technology change make the teacher job more challenging. The local Village Education Committees and local self-governing bodies started giving importance to attending to school management issues. Also there is lack of clarity on the relative position of new posts created in the system, such as cluster co-ordinators vis-à-vis primary school heads. (Mohanty)

Internal Management of the School

Traditionally, teachers in government schools expect to receive instructions from the head teacher with regard to most of their activities. He or she is also responsible for the effective management of the class which is directly linked with the learning achievement of the student and the level of transition of the student from one class to the other class.

Internal Decision-making in the School

Our experience in the field reveals that effectiveness of class room management depends heavily on the personal initiative and leadership of the teacher and his or her style of maintaining human relationships with the children and within the school and with the departmental authorities. It is also observed that the school teacher after certain years of service become reluctant to adopt the change. In most of the schools there is no custom for regular staff meetings where they discuss new problems at the class room. In contrast, the private school teacher enjoys much greater freedom in internal management and decision-making at the school level. In many cases, the teachers are very close to the head teacher and senior authority so no system prevails to check his/her inefficiency. The closeness of the relations between the Management Board and the teacher seems to be the determining factor in the effectiveness of the roles and functions performed by the school teacher.

Management of Personnel

Student management is a critical area in which most government school teachers feel highly constrained. Typically, a government school teacher looks less motivated in the class and to adopt the new changes. Their lesser attentiveness in the class leads to the drop out of the student from the class. Classrooms which consist of different groups with different levels of learning need an efficient manager who can handle such issues. The performance of government schools is completely different in this context.

It is hoped that the ongoing decentralization process will change this situation and empower the stakeholder to take action against teachers who are not performing in the class room. This again is an area in which the private school teacher seems to more accountable rather than the government school teacher.

Academic Management

The core area of school functioning is management of academic activities, including curriculum management and conduct of examinations. In general, there is limited freedom for the school teacher with respect to curriculum and annual examinations, which are centrally controlled by school authorities. However, government school teacher have not taken initiatives so as to improve the teaching learning process. The private school teachers have shown some innovation in terms of experimenting with new learning tools. In the government school structure, there is hardly any evidence of implementing curriculum to introduce flexibility in curriculum implementation, in organization of co-curricular activities, in promotion of innovations in curriculum transaction, and in taking decisions on the nature and periodicity of tests as well as in promotion criteria for students. Private schools also promote the use of alternate and supplementary texts though they generally follow the officially recommended books. What about government schools? The general refrain of government-school teachers is that they enjoy no freedom at all. They are constrained both by resources and pressures from higher authorities. The field reality, however, shows very little signs of enthusiasm in government schools to innovate curriculum transaction processes which are usually obstructed by the authorities.

Performance Assessment and Career Development

The pivotal role of the teacher in the effective functioning of the class is universally acclaimed. In most of the government set-ups, the standard approach of Annual Confidential Reports form the basis for reviewing the performance of a teacher. These reports are supposed to reflect his or her capability on certain generic parameters, such as: quality of performance, communication skill, sincerity and devotion to duty, initiative, creativity, resourcefulness, willingness to take on responsibility and leadership qualities. No doubt these are very important qualities for a teacher, but they require careful observation and recording for which there is no provision in the framework of their evaluation. The evaluation essentially consists of examining the reports written by other higher authorities within the department, and cursory observations during fleeting visits by the reviewing officer. Consequently, such reviews of teachers by higher authorities remain practically redundant. Also, as can be seen, they do not constitute concrete, objectively assessable criteria of the teacher's performance. That these are still used for departmental promotions is a contentious issue.

Career prospects for teachers of primary schools in most of the states are very limited. One often finds teachers aspiring, at best, to retire as head teachers. Madhya Pradesh and Karnataka do provide some opportunities for promotion to block-level positions. Kerala is the only state that allows for career development opportunities that go up to the district-level positions. The situation is significantly better for secondary school teachers. This is particularly true of those who come through direct recruitment at a relatively younger age or through competitive selection processes. (Govinda)

Academic Supports and Capacity Building

With the fast-changing social order, as also the economic life pattern of individuals and families, expectations from the school have also increased. What kind of support and training do the teachers have, to face the emerging challenges at the school level? Training and capacity building for teachers is the weakest dimension of the school education system in all the states. Many of those who become teachers receive no orientation or training.

They are expected to receive support and guidance on the job from the supervisors during their school visits, but with highly infrequent school visits by supervisors, the life of the teacher is a lonely journey with practically no professional support or training.

In recent years, through special project initiatives under SSA, the states have begun implementing programmes of capacity building for teachers. The State Institute of Educational Management and Training is also implementing a leadership training programme for teachers. Various NGO also developed training program for the teachers. These are only marginal efforts both in terms of substance and quantitative coverage. In-service professional development programmes have yet to become a standard feature of the system. Similar to the in-service training facilities, creation of decentralized institutions, such as Block Resources Centres and Cluster Resource Centres, may provide useful platforms for collaborative learning and support for school teacher. However, the real change can occur only when a quality parameter is introduced in the teacher training. ICT can play an important role in term of capacity building of the teacher. Here the challenge lies in the institution capacity to deliver training. Under SSA most of the northern state doesn't have up linking facilities.

Pre service teacher training

The National Council for Teacher Education (NCTE) was established on 17 August, 1995 by an Act of Parliament (No 73 of 1993) as a statutory body to achieve planned and coordinated development of teacher education system throughout the country, the regulation and proper maintenance of norms and standards in the teacher education system and for matters connected therewith. The mandate given to the NCTE is broad and covers the whole gamut of teacher education programmes including research and training of persons for equipping them to teach at pre-primary, primary, upper primary, secondary and senior secondary stages in schools, non-formal education, part time education, adult education and correspondence education courses. Table 1 and 2 provides input on teacher training in India.

Table 1: Number of Teacher Training Institution

States/UTs	Teacher Training Colleges	Teachers Training School	Teleconferencing, e-learning facilities
Andhra Pradesh	87	25	NA
Arunachal Pradesh	0	0	NA
Assam	39	1	NA
Bihar	15	58	NA
Chattisgarh	1	4	NA
Goa	2	1	NA
Gujarat	51	78	NA
Haryana	21	37	NA
Himachal Pradesh	4	12	NA
Jammu & Kashmir	8	14	NA
Jharkhand	7	29	NA
Karnataka	68	134	NA
Kerala	21	102	NA
Madhya Pradesh	21	27	NA
Maharashtra	242	286	NA
Manipur	3	1	NA
Meghalaya	2	6	NA
Mizoram	2	2	NA
Nagaland	2	1	NA
Orissa	16	67	NA
Punjab	24	27	NA
Rajasthan	45	46	NA
Sikkim	1	1	NA
Tamil Nadu	22	82	NA
Tripura	1	2	NA
Uttar Pradesh	121	56	NA
Uttaranchal	1	9	NA
West Bengal	26	58	NA
A&N Island	1	1	NA
Chandigarh	3	1	NA
D&N Haveli	0	0	NA
Daman & Diu	1	1	NA
Delhi	10	23	NA
Lakshadweep	0	0	NA
Pondiicherry	5	10	NA
India	873	1202	NA

Table 2- Number of teachers at different levels and % of trained teacher

States/UTs	Number of Teacher at primary level	% of trained teacher	Number of Training at Middle level	% of Teacher
Andhra Pradesh	179961	94	108222	88
Arunachal Pradesh	3218	28	2864	33
Assam	86112	73	58703	36
Bihar	78204	95	55734	95
Chattisgarh	58348	61	25954	68
Goa	2523	94	552	98
Gujarat	18208	98	196388	94
Haryana	39029	89	13449	92
Himachal Pradesh	29018	87	9900	99
Jammu & Kashmir	26339	61	36795	69
Jharkhand	30193	95	26301	95
Karnataka	61004	100	167451	100
Kerala	42497	98	46544	96
Madhya Pradesh	146766	65	148333	67
Maharashtra	123392	96	189583	96
Manipur	8245	22	8834	19
Meghalaya	14397	45	5540	36
Mizoram	4628	82	6170	80
Nagaland	7011	37	4563	42
Orissa	85760	99	48677	99
Punjab	41524	95	13737	98
Rajasthan	92714	86	157284	91
Sikkim	2746	50	1661	42
Tamil Nadu	123369	100	56086	100
Tripura	8951	28	5672	20
Uttar Pradesh	384605	98	148395	95
Uttaranchal	36923	100	15284	100
West Bengal	151255	67	11275	81
A&N Island	788	93	723	96
Chandigarh	300	100	92	100
D&N Haveli	225	96	612	97
Daman & Diu	277	100	156	100
Delhi	22611	100	8295	100
Lakshadweep	36	100	317	100
Pondicherry	1754	96	1593	92
India	1912931	86	1581739	87

Source: Seventh All India Educational Survey, MHRD

From Table 1 and 2 we observe that some states are giving preference to training. At the same time, few are just reluctant about it. An interesting observation can be drawn from the table 1&2 that number of teacher training colleges/schools does not directly responsible for the percentage of trained teacher. Like in North-eastern states the number of training school is lesser in number but the percentage of trained teacher is also low. In case of Uttaranchal this is not the reason. Because despite few training school, the percentage of trained teacher is 100 percent. Another important observation we can draw that the level of literacy and quality of education is also not directly linked with percentage of trained teachers in the state like in the case of Bihar and Orissa. At the same time in the southern states like, Kerala Tamil Nadu and Karnataka the number of trained teachers is high but at the same time quality of teaching in the government school is also far better than many states.

In service teacher training policy

In the present context, many of the state teacher training institute do not have sufficient infrastructure to provide training to the teacher. The changing technology innovations may be able to bridge the demand and supply gaps. The major problem lies in providing sufficient infrastructure to these training institutes. Under Sarva Shiksha Abhiyan (SSA), the vision to develop a state level training institute also does not look effective. After five years of implementation of SSA some of the states were unable to make SIEMAT operational. Under the SSA the Indira Gandhi National Open University (IGNOU) has initiated teleconferencing to provide teacher training. Still only in 107 districts are facilities for tele conferencing available. If we analyze the demand and supply matrix still a lot has to be done.

Teacher capacity building

The role of school teachers is crucial for achieving the objectives of UEE. Therefore, improvement in quality both at the pre-service as well as in-service teacher training programmes is to be ensured. At present, around 35 lakh teachers are serving 16.92 crore students, in 8,96,656 schools at the elementary stage. Around 14 percent teachers at the lower primary stage and 13 percent at the upper primary stage are still untrained. To provide pre-service of two years duration through formal diploma is a Herculean task. The distance learning mode can complement/ supplement the face-to-face mode of training in terms of time and unit cost per trainee. Similar situation arises for in-service teacher training programmes in updating and upgrading contents and pedagogical skills.

Structure of present teacher training process

It is important to understand the structures that perform various functions in order to analyze the processes. Traditionally, the government machinery, in the form of administrative structures, controlled all the activities in school education, including elementary and secondary levels. Although this continues to be largely true even now, space has been created for players other than administrators both within and outside the administrative structures. During the late 1970s and early 1980s, the State Councils of Educational Research and Training (SCERTs) were established under different names, mainly by bringing together a number of government-owned training institutions in the school education sector. Though this institution was established as one of the wings in the administrative set-up, this had the character of an academic structure in terms of nomenclature, staff structures and job roles. During the late 1980s and early 1990s, District Institutes of Education and Training (DIETs) were established under a centrally sponsored scheme to provide academic/technical support to elementary education. Some states, like Gujarat, have started giving autonomous status to the SCERTs/ DIETs within the broad governmental framework, but these remain part of the government's administrative structures in most other states in India.

Local Self-Government in the form of elected Panchayati Raj Institutions (PRIs) in rural areas, and Municipal governments in urban areas, had some power or say in elementary education in almost all the states during the 1950s and 1960s. However, the structure of these bodies, as well as their roles and responsibilities, varied widely across the states. During the later years, while the PRIs were strengthened by the delegation of additional powers for an enlarged role in development in some of the states, in many others these bodies experienced a contraction in their role. By their very nature, the PRIs are political bodies and do get affected by the character of the politics of the land. In 1992, the Government of India (GOI) passed the 73rd and 74th Constitutional Amendments which provided for compulsory direct elections to three tier Panchayat bodies, with reservations for weaker sections like Scheduled Tribes, Scheduled Castes and women.

Thus, the structures in elementary education could be divided along three lines – administrative, academic and local bodies. The late 1980s and early 1990s saw the emergence of a number of large programmes bringing in a holistic approach and covering almost all aspects of the primary/elementary education sector, as different from schemes focusing on one or two individual items. These projects/ programmes are supported by external funding and came into existence primarily under “Education for All” initiatives. These included the Bihar Education project in Bihar, Lok Jumbish in Rajasthan, UP Basic Education Project in Uttar Pradesh, Andhra Pradesh Primary Education Project in Andhra Pradesh, and the District Primary Education Project in 15 states. These projects and programmes added a fourth dimension to the elementary education system. Although these do not have any administrative powers, many of the interventions have far-reaching implications.

Political/Local bodies, Administrative and Academic Support structures in Elementary Education

Level	Political/Local bodies	Administrative	Academic Support
State	State Ministry of Education	Secretariat/Directorate of Education	SCERT
District	<i>Zilla Panchayat</i>	District Education Office	DIET
Block/Sub-block (<i>Taluka/ mandal</i>)	<i>Block Panchayat</i>	Block Education Office/ School Inspectorate	Block Resource Centres/ Cluster Resource Centres*
Village	<i>Gram Panchayat</i> **V Edu. Committee	Headmaster	Teachers

* *These structures have been created by the District Primary Education Programme, or some other similar project and, therefore, may not be present in every district.*

** *A Gram Panchayat generally covers a cluster of 4-8 villages, depending upon the size of population.*

The knowledge revolution and role of the teacher

The pace of technological revolution and emergence of a knowledge society can change the traditional role of the teacher and the students. Traditionally, the teacher used to be the source of knowledge for the students. There is some cooperation among students to explore new knowledge. In many cases, the teachers do not possess adequate knowledge to supplement the view of the student. And the main source of knowledge remains limited to text book. The development of ICT changes the epic centre of knowledge. At present, in a number of cases the student is more informed than the teacher. Furthermore, there is likely to be confusion in the teachers mind about his/ her new role in relation to the use of these technologies i.e. teachers find themselves in a situation where they are no longer the principle source for delivery of information. In the new phase of the knowledge revolution the source of knowledge has shifted from a one source to a different source. In other words, we can say that there is a decentralization of the knowledge source. This has an overall impact on the development of learning abilities among the children. There is a need to facilitate training on ICTs for teacher both at the pre service level and in service level.

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 programme. 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.

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 Carnoy¹⁴ 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 alone, 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 pre-service 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) programme, where ICT plays a large role in enabling interaction between students, tutors, regional support centres and programme providers '.

ICTs and Teacher Education

There are a variety of approaches to professional development of teachers in the context of use of ICTs in education. Professional development to incorporate ICTs 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 ICTs; and teacher education through ICTs.

Teacher Education in ICT

The most obvious technique for professional development for teachers is to provide courses in basic ICTs knowledge and skills. It is necessary for teachers to become skilled in operating the new technologies and in exploiting them effectively as educational tools. Teachers must master the use of information – skills of research, critical analysis, linking diverse types and sources of information, reformulating retrieved data – if they are to teach their pupils to develop these same skills. There needs to be more emphasis placed on training in pedagogy, as opposed to the current trend in many education systems where the major focus is on specialized knowledge in specific curricular subjects. Teachers must be adequately equipped with more didactic competencies so as to assume their new role as experts in the learning process.

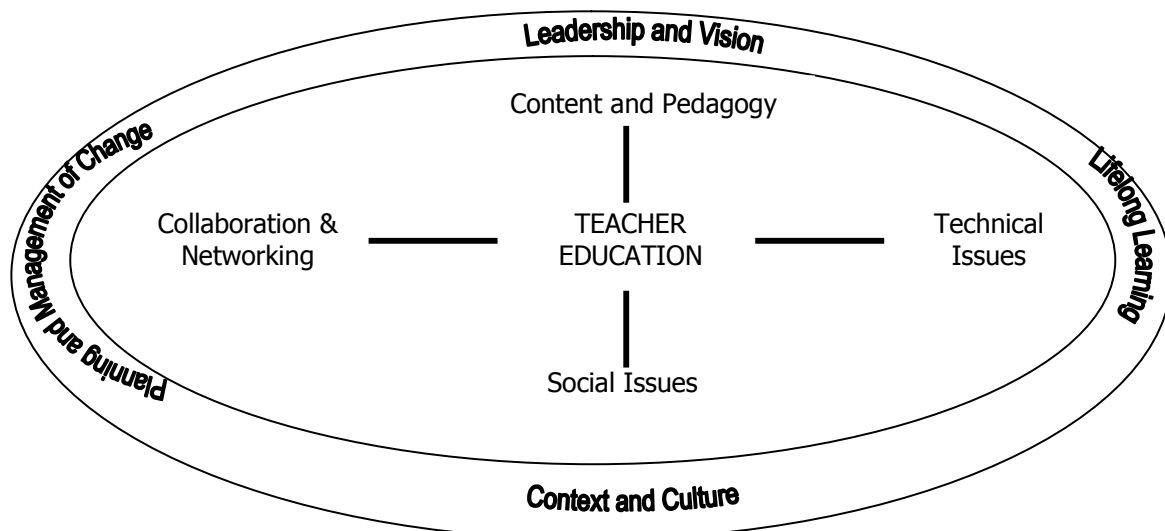
Teacher Education through ICTs

ICTs can support effective professional development of teachers. Using ICTs as tools for training of teachers is as important as introducing the basics of ICTs to the prospective teachers. As sources of information and expertise, as well as tools for distance communication, ICTs can offer many new possibilities for teacher education. Teachers may learn new forms of communication through the regular use of these technologies. Use of new media, new rules of communication – even a new language – have to be learned.

A Framework for ICTs in Teacher Education

In planning for infusion of ICTs into teacher preparation programmes, the factors important to a programmes success must be considered. A holistic framework proposed by the UNESCO (2002) takes into account the factors, e.g. cultural, educational, technology resources that are important in planning the integration of technology into pre-service curriculum. The framework provided in figure – 1 has been designed to assist policy makers, teacher educators, textbook writers, and other professionals who are charged with developing the use of ICTs in teacher education.

Figure – 1: A Framework for ICTs in Teacher Education



Source: UNESCO, 2002-a, p.41

Figure – 1 shows that the curriculum framework is comprised of four clusters of competencies encircled by four supportive themes. The curriculum framework also suggests that each teacher is allowed to interpret the framework within his or her context and personal approach to pedagogy, which is always related to the subject discipline or content area, rather than to the technology itself. The model illustrates the interdependence of the themes and competencies – all themes interacting with all competencies.

Four Themes

Context and Culture identifies the culture and other contextual factors that must be considered in infusing technology into the teacher education curriculum. It includes the use of technology in culturally appropriate ways and the development of respect for multiple cultures and contexts, which need to be taught and modelled by teachers. **Leadership and Vision** are essential for the successful planning and implementation of technology into teacher education and require both leadership and support from the administration of the teacher education institution. **Lifelong Learning** acknowledges that learning does not stop after school. **Planning and Management of Change** is the final theme, born of today's context and accelerated by technology itself. It signifies the importance of careful planning and effective management of the change process. These themes may be understood as a strategic combination of approaches that help teacher educators develop the four core competencies. The core competencies may be seen as clusters of objectives that are critical for successful use of ICTs as tools for learning.

Four Competencies

The ICT competencies are organized into four groups. **Pedagogy** is focused on teacher's instructional practices and knowledge of the curriculum and requires that they develop applications within their disciplines that make effective use of ICTs to support and extend teaching and learning. **Collaboration and Networking** acknowledges the communicative potential of ICTs to extend learning beyond the classroom walls and the implications for teacher's development of new knowledge and skills. Technology brings with it new rights and responsibilities, including equitable access to technology resources, care for individual health, and respect for intellectual property included within the **Social Issues** aspect of ICT competence. Finally, **Technical Issues** is an aspect of the Lifelong Learning theme through which teachers update skills with hardware and software, as new generations of technology emerge.

Role of ICT in bringing efficiency of delivery mechanisms

Efficient delivery mechanisms are an important component of overall school management. ICTs can provide the efficiency of delivery mechanisms of educational services by supplementing conventional delivery mechanisms:

- Technology's capacity to reach learners in any place and at any time has the potential to promote revolutionary changes in the educational paradigm. This means eliminating the premise that learning time equals classroom time. Students can be encouraged to revisit the lessons/topics to reinforce learning without active intervention by teachers.
- Another illustration of efficiency is the domain of virtual laboratories. All school systems want to provide labs because science is empirical. But few schools have furnished them with equipment and supplies and fewer yet are willing to risk using them. Technology allows for video and digital demonstrations as well as digital simulation of laboratory activities in a very real manner – but without the risks and costs associated with laboratory experiments. Simulations will not replace hands-on activity completely. Rather, they prepare the learner to conduct real-life experiments in the same manner as flight simulations prepare the student pilot for test flying.
- Multimedia-enabled learning modules can be developed by a group of master teachers and instructional designers, which can then be shared with all schools to assure quality standards of learning delivery.
- Concerns about costs are always raised in discussions related to technology. Depending on the technology used, startup costs can be high but economies of scale are significant. That is, the more the technology is used i.e. when more students use the product, the unit costs of producing educational content ware decrease proportionately. Trade-offs must be considered as well when evaluating technology's initial costs

Viewing the Indian Scene in Global Context

The emergence of a globalized world underscoring a framework of competition, and coupled with the pressures of an exploding knowledge base, has given birth to new challenges for schools as social institutions all over the world. New demands are placed on the school, often in addition to the existing ones, to be equipped with current knowledge and modern methods of acquiring new knowledge. This has become particularly complex with the far-reaching impact of ICT on almost every sphere of human life. It is clear that the school continues to hold its supremacy, more through the invincible mechanisms of the centralized curriculum and examination than by virtue of what transpires in the school. It is within this context that one has to understand the changing face of the school and the role of the teacher in its management. A quick review of the situation in many parts of the world would help appreciate the challenges that the Indian school system faces in redefining the roles and functions of school heads in the country.

Review of recent developments in the school education sector across most countries shows that the teacher or the school principal has come to occupy a more central position than ever before. Invariably, the onus for projecting the school's worth in the increasingly competitive world is essentially placed on the head teacher. Three sets of developments in this regard are important: (1) School as the unit for planning and development: Traditionally quality improvement in education has meant introduction of system-wide reforms, often focusing on curriculum reform measures or setting new benchmarks for provision of facilities in schools. This approach has gradually begun to give way to treating the individual school as the unit for improvement action. This obviously has a significant impact on the roles and functions of the teacher. In this respect, every school has to acquire an institutional identity and meet the social

as well as official expectations in a competitive framework. (2) Accountability based on performance linked to outcomes of schooling: Open choice, competition and official assistance linked to performance define the emerging framework for assessing school functioning. Studies show that the new performance-assessment framework is putting unprecedented pressure on the school head to show results. Though some aspects of this approach have attracted considerable criticism for trivializing school education and making it unduly examination oriented, the trend has gained greater momentum in many parts of the world. (3) Increased internal autonomy: A direct consequence of the changes mentioned above is the increased autonomy in the daily functioning of the school with implied enhancement in the powers and responsibilities of the school head. Every teacher is expected to lead the school towards improved standards of functioning by shared understanding of the goals of the school and securing the contribution of everyone. (Mohanty)

How does one view the Indian situation in the changing global context? The changes emerging on the Indian scene are not as concrete as the ones seen in the international trends. However, the critical role of the school teacher in spearheading programmes of quality improvement in education has come to be recognized in recent years. One indication of this is the increased attention being paid in India to the phenomenon of institutional planning or school improvement planning. The situation is, of course, quite fluid in many states. The growing number of small schools with one or two teachers raises serious issues in redefining the roles and functions of school heads in the country. Increasing division of the school sector, in terms of government and private-operated with diverse ground rules, also makes it difficult to predict the direction the Indian school system would take in the near future.

After all, it needs no special project to recognize that quality improvement of schools in the final analysis hinges on the effectiveness of the principal - his or her vision, human relations and professional competence.

Way Forward

To resolve the present challenge some of the states had taken innovative steps to use ICT as a tool to improve the teaching learning process. The experience of ASSAM and ORISSA to implement Computer Aided Education (CAE) under SSA for teachers shows a positive result in terms of teacher empowerment and improving the learning level among the student. The important outcome of this experiment is as follows.

Confidence building

The research on teacher development shows that school reforms cannot succeed unless it focuses on creating the conditions in which, the teacher can teach and teach well (National Commission, 1996). With the introduction of CAE, the teachers are no longer depending on a single source of information, typically a textbook, but are exposed to opportunities to use a variety of information sources. Teachers are trained to handle the computer, prepare data sheets for upgrading their skill. The use of the computer in itself is boosting the confidence of the teacher and is leading to the creation of innovative ideas and practices.

Sharing

The teacher knowledge on 'word processing' helps in preparing the mark-sheets of the students, conducting unit test etc. This facilitates making use of such database form for planning and pursuing activities. Being confident a teacher is now experiencing comfort in sharing the classroom practices with the academicians, expert groups, and parents. This makes sharing of the school records with different stake-holders easy and productive. The most important aspect of sharing involves the innovative ideas generated by teachers involved in novel learning activities while providing support to students. Such ideas generated in computer classes & block level meetings of teachers help them to believe in their own capacity to create more.

Decision-making

With the use of computers as a means of self-learning, the teacher has to make several decisions for facilitating the learning situations in school. The decision as to when to use the CDs relating to a particular content, how to allocate time and space for classroom transaction and at what point to interfere while handling the CDs are decisive. To facilitate the interactive mode of learning of students, the teacher's decision is critical in providing learning opportunities appropriate to level and needs of the learners.

Planning and Taking Actions

Being well-versed in handling the 'spread sheet' the teacher becomes capable of preparing long documents on the computer. So he/ she records the student's performance, attendance record etc. to make thorough planning for each student. The analysis of such records is guiding the teachers to make suitable strategies for each student. The planning becomes more focused and result oriented. The teacher becomes capable of preparing action plans for facilitating CAE in the schools. Although such result based decision making is possible in a non-technology infused system, it is more difficult, time consuming and inefficient (Hertzke & Olsen, 1994).

Facilitating student learning

With computer-aided education, the children are learning concepts with the help of graphics, animation, story etc. The content CDs developed in hard spots such as Math, EVS and language provide a resource support to the teachers to teach the curriculum in a more effective and child friendly manner. Furthermore, CAE offers the teacher an opportunity to make the materials interactive for learners which facilitates student learning and creates a scope for teachers to make an innovative learning environment for the students. CAE empowers the teachers to create opportunities for promotion of group learning and self-learning. The students see their performance each day in a different light. They become concerned about reaching the desired performance levels, and their progress rapidly improves (Hertzke & Olsen, 1994).

The content CDs are developed on the hard spots identified by the teachers. The teacher is now better equipped to handle the teaching-learning situation. The students exposed to the interactive mode of the learning situation with colourful graphs and animation are showing greater interest in learning activities.

The implementation strategies of CAE in Orissa have exactly addressed those concerns. The CAE has been designed not only to help the children to learn but also to help the teachers teach effectively. The vision is to make the teachers job easier, more productive and more self-satisfying.

Decision making follows a careful planning of the students learning situations, tapping available resources and taking appropriate actions facilitating students' involvement in CAE and in learning outside the computer room.

All these processes are continuous and challenging from which the teacher cannot but get more and more involved, thus getting more and more empowered. Therefore, CAE is not being thought of discretely as an alternative learning strategy but as inseparable component of an ever-enriching learning process. Considered within a holistic scenario of learning, the real empowerment of teachers is on the threshold of new possibilities.

Emerging Scenario

CAE has already evoked positive responses from the learners, teachers and parents. The increasing demand for its up-scaling has immense concerns for the teachers. While they will be getting more and more involved in encouraging students to use computers more and more for self-learning, they will also have to use it for upgradation of their personal knowledge.

Personal knowledge, in this context, shall have wider ramifications which shall include upgradation of content knowledge, awareness of computer programmes and operations, developing scripts for hard spots contextual to meet the learners' needs, probing into novel learning activities using internets. The immense potentiality of CAE can, thus draw the teachers to update their knowledge and skills

Conclusion and Recommendation

The technologies offer vast opportunities for the development of contacts and exchanges with the rest of the world. Incorporating the technologies successful into schools requires careful advanced planning and preparation. Significant financially and human resources are required, with training as an essential component of the process. Redundant and robust systems must be put in place. Innovators have to be prepared to confront bureaucracy and conservative attitudes, including resistance by teachers and other educational staff. The following points must be kept in mind while designing the content as well as the process of education:

- ICT will have a deep impact on the way formal education is carried out;
- The rate at which we have to respond to changes affecting education is much faster than ever before;
- It is urgent to realign the curriculum framework to provide outcome-based, flexible learning paths leading to mastery learning;
- Training and orientation of teachers, administrators and students to the new learning technologies is an immediate requirement;
- Teachers already in the profession should have the right to adequate time and resources for continual professional development to acquire and maintain ICT skills
- Teachers should have adequate time to plan the introduction of ICT into their pedagogical practices to ensure high quality and appropriate learning.
- To ensure that teachers, educational authorities and other stakeholders enjoy the maximum benefits from the use of these technologies, all should be involved in information sharing, consultation and negotiations, according to the issue involved.
- Building appropriate information systems, including channels for sharing and communication. Also identifying means for accessing/developing knowledge and ensuring their use in taking critical decisions.
- Redefining some of the processes and procedures, with an in-built emphasis on answerability towards people. In other words, "peopleising" the processes. The focus should also be on transparency and the use of information/objective criteria.
- Reorienting administrative/academic personnel with a focus on i) sectoral goals and objectives, and the role/responsibility of administration in achieving the same, ii) functioning with a sense of accountability towards people, and iii) use of information and knowledge for making decisions.
- In-depth review of mechanisms and modes that exist presently in different states/ programmes for ensuring horizontal linkages, in different states in the area of education, as well as in other social sectors; identification, analysis and development of the most suitable state-specific means to facilitate faster, co-coordinated and improved administration for the elementary education sector.

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