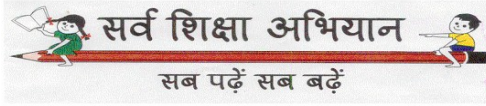# Technology-mediated Learning for Professional Development of Personnel at Elementary Education Level

Distance Education Programme-Sarva Shiksha Abhiyan
(DEP-SSA)
(An IGNOU-MHRD, Govt. of India Project)
Maidan Garhi, New Delhi – 110 068

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November 2009

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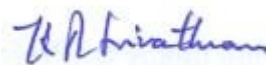
Message from the PVC

Sarva Shiksha Abhiyan (SSA) is a flagship programme of the Government of India to achieve Universalization of Elementary Education in a mission mode.

Distance Education Programme – Sarva Shiksha Abhiyan (DEP-SSA) is a national component, carved out within the SSA framework by MHRD, Government of India, to augment its capacity building efforts in this direction, in collaboration with Indira Gandhi National Open University (IGNOU). The activities of DEP-SSA are mostly targeted towards capacity building of elementary level functionaries so as to bring about a qualitative improvement in curricular transactions. Open and Distance Learning technologies play a major role in evolving sustainable training systems for teachers and other functionaries of SSA.

The National Seminar on "Technology-mediated Learning for Professional Development of Personnel at Elementary Education Level" organized by DEP-SSA, IGNOU is a commendable effort in this direction, as it enabled discussion on pertinent issues, based on research findings and experiences of the field level functionaries. The Seminar deliberations brought to the fore some challenges which need to be addressed through ICT interventions and also provided useful suggestions. Some innovative approaches to achieve qualitative improvement in SSA efforts were suggested like – development of open educational resources, use of qualitative and action research, use of mobile learning technology, e-mentoring, web-based training and need of multimedia portal for continuous professional development of the target groups through on-line publishing and on-line discussion forum.

The need of the hour is to bring about qualitative improvement in the teaching-learning process, for which requisite skills and competencies have to be imparted to the elementary education personnel. Technology has to be integrated and used effectively to manage the learning environment and its uniform diffusion has to be ensured, so that the digital divide can be bridged.

The DEP-SSA document, which is a compilation of ten papers presented during the national seminar, will be a useful and informative resource for all the practitioners, functionaries and professionals interested in the mission of achieving universalization of elementary education in the country. I congratulate the former Project Director, DEP-SSA, Dr. S.S. Jena and his team for organizing this national event and for bringing out this document..

Prof. K.R. Srivatsan
Pro Vice-Chancellor, IGNOUand
Director I/C, DEP-SSA, IGNOU

FOREWORD

Sarva Shiksha Abhiyan (SSA) is a flagship programme of the Government of India to achieve the objective of Universalizing Elementary Education in the country in a mission mode. The programme seeks to improve human capabilities of all children through community owned quality education. SSA mainly focuses on capacity building at district, state and national levels, thereby empowering the individuals and institutions for an efficient delivery system. It is operational in all the 35 states and UTs in the country. To further strengthen the capacity building activities of SSA, the MHRD, Govt. of India has created the Distance Education Programme (DEP) as a national component within SSA, in collaboration with IGNOU, which is the national apex body for ODL. The DEP-SSA seeks to empower teachers and other functionaries at elementary level for their effective participation in curricular transactions and classroom processes. The main objective of DEP-SSA is to evolve a sustainable training system for elementary school teachers through the distance mode, by using distance learning inputs, such as Self-instructional materials (Print, Audio, Video, Multimedia packages) and providing workplace based training to the functionaries, for utilization of ICTs in the teaching-learning process. It also endeavours to strengthen and consolidate the professional development activities of teachers and other stakeholders for enhancing quality education at elementary level through effective use of ICT. Considering the diversified and heterogeneous spread of elementary level functionaries throughout the country and the need to share their experiences, DEP-SSA organized a National Seminar, on the theme, "Technology-mediated learning for Professional Development of Personnel at Elementary Education Level", at IGNOU, New Delhi from March 13-15, 2009.

The objectives of the Seminar were:
- To discuss and identify areas of professional competencies in the context of capacity building of teachers and other personnel at elementary level;
- To share best practices on technology supported professional programmes;
- To deliberate on the issues and concerns related to use of appropriate technology; and
- To develop context specific sustainable training strategies for capacity building.

Papers were invited from functionaries of SSA and professionals all over the country to deliberate, present their research findings and share experiences related to the seminar theme. The theme was further categorized into the four sub-themes:

- Training Inputs for Professional Development
- Appropriate Technology for professional Development.
- ICT for Marginalised and Disadvantaged Groups
- Researches on Technology for Professional Development

The invitation for participation in the seminar resulted in a good response in all the four themes. Intensive discussions and debates were held pertaining to the role and impact of technology for capacity building at elementary level. Out of the 48 papers presented during the seminar, 10 have

been selected for publication as a useful and informative document for all associated with quality elementary education.

I wish to thank all the presenters for their active participation in discussing vital issues during the three day seminar. Their research findings and presentations based on field level experiences will be very useful for all stakeholders, particularly teachers. Thanks are also due to the organizational heads for deputing their faculty for participation in the seminar. I also express my heartfelt thanks to all key note speakers for their presentation to initiate discussions on each of these themes of the seminar.

I wish to express my gratitude to the Department of School Education and Literacy, MHRD, Government of India, for entrusting DEP-SSA with the responsibility of improving the professional competency of elementary education functionaries associated with SSA.
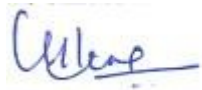
I am immensely grateful to Prof.V.N. Rajasekharan Pillai, Hon'ble Vice Chancellor, IGNOU, and Chairman DEP-SSA, for providing constant guidance, support, encouragement and the necessary administrative support and cooperation to bring out this document.

A special word of thanks to all the chairpersons, who moderated the sessions of the seminar. The sessions were enriched by their useful inputs and deliberations.

I thank Dr. Eisha Kannadi, School of Educaion, IGNOU, for meticulous language editing of the document.

My thanks are due to the faculty of DEP-SSA for the smooth conduct of the national seminar and especially Dr. Hema Pant, Programme Officer, DEP-SSA for her meticulous planning and untiring support in co-coordinating the event of this magnitude and for her effort in bringing out this document. A word of appreciation also goes to the staff of DEP-SSA for extending their full support in organizing the seminar.

I do hope this document will provide useful insights to all those concerned and involved with the mission of achieving quality elementary education in the country.

(Sitansu S. Jena)
(Former) Project Director

About the Document

The Government of India has launched the Sarva Shiksha Abhiyan (SSA) as a flagship programme, with the prime objective of achieving Universalization of Elementary Education. The 86th Amendment Act of the Indian Constitution provides for free and compulsory elementary education as a fundamental right of all children of 6-14 years of age. The programme emphasizes capacity building and empowerment of individuals at district, state and national levels for providing quality elementary education.

An important intervention in the scheme of SSA is the Distance Education Programme (DEP), which has been created as a national component by the MHRD, Government of India. The DEP-SSA operates in collaboration with IGNOU, since July 1, 2003, in all the 35 states and Union Territories of the country. IGNOU, which is the national apex body for implementing coordinating and monitoring open and distance education activities, is entrusted with the responsibility of achieving the goals of education and training of SSA functionaries. The main aim of DEP-SSA is to evolve a sustainable training system for elementary school teachers and functionaries through open and distance education inputs like – developing high quality training materials (print, audio, video, multimedia packages), workplace based training inputs, training in content generation for ICT utilization. With rapid advancements in technology DEP-SSA, strives to further enhance the quality of elementary education through ICT interventions in its capacity building endeavours. The efforts are focused on professional development of teachers and SSA functionaries through effective use of technology. It also seeks to foster the spirit of cooperation, collaboration and networking of resources across the states. This assumes greater significance in the content of multicultural, multi lingual and a geographically diverse country like India. There is a need to focus on improvement of classroom processes, redesign the existing curricula and make teaching-learning more learning centric. This is possible only through a sustained, recurrent in-service training of teachers for enhancement of their professional competencies, which can be achieved through the Open and Distance Learning mode.

In view of this, the Distance Education Programme – Sarva Shiksha Abhiyan (DEP-SSA), IGNOU, organized a National Seminar on "Technology-mediated Learning for Professional Development of Personnel at Elementary Level" from March 13-15, 2009, at IGNOU, New Delhi.

The seminar was organized to share the best practices of teachers and elementary level functionaries across the country. It provided a platform for discussions on the state of teacher preparedness and measures adopted to address quality issues by the state level functionaries. Other objectives of the seminar related to using appropriate technologies for

capacity building and developing context-specific sustainable training systems for teachers and other stakeholders.

The National Seminar brought together academics, professionals and functionaries of SPOs, SCERTs, DIETs, for a discussion on the current and emerging issues pertinent to the theme. The response from all over the country was good, as 89 papers were received. A duly constituted Screening Committee selected 48 papers for presentation in the seminar.

DEP-SSA has made an attempt to publish 10 of the papers in the form of a meaningful informative and useful document.

- **Professional Development of Teachers in a New Paradigm of Technology-mediated Constructivist Learning.**
  Prof. H.K. Senapaty from RIE, Bhubaneshwar discusses the urgent need for creating technology mediated constructivist environment for the continuous professional development of teachers. He emphasizes the re-organization of pre-service and in-service teacher training programmes in accordance with the constructivist pedagogy, using latest ICTs. The paper emphasizes the need for teachers to keep abreast of the latest researches and practices that would help them to achieve qualitative improvement in the classroom transactions and adopt innovative pedagogical approaches.

- **Ongoing Teacher – Facilitation (English Language) through Teleconferencing: The Karnataka Experience.**
  Dr. Kumaraswamy from Mysore discussed through this paper, the ongoing support provided to teachers in all Blocks of Karnataka through Teleconferencing. He highlighted the process by which teachers of Classes I to IV were provided support in English teaching, through teleconferencing, in a continuous manner. The ROTs were installed at DIETs and BRCs across the state where the teachers attended the training programme. The feedback obtained from teachers reveals enhanced motivation levels and for the programme a positive attitudinal shift towards such interactive and collaborative training mechanism.

- **Nurturing Teacher Empowerment and School Effectiveness through Edusat Oriented Training Programme : An Impact Study**
  The paper was presented by Dr. L.N. Pandey and Dr. (Smt.) Deepa Agnihotri from Rewa, M.P. They focused on the importance of teachers being techno literate and competent in technology use. The paper deliberated on the efficacy of EduSat oriented training programmes being undertaken for teachers at elementary level in Sidhi district of M.P. and suggested some practical measures for effective utilization of EduSat lessons under SSA.

- **Experience with Blogging in a Teacher Education Institution.**
  The paper presented by Nimrat Khandpur from Amity University, NOIDA explores the potential of Blogging, especially for teacher preparation and teacher development. The author discusses the significance of Blogging for teachers and teacher educators, as a important resource for teaching-learning. This can optimize teacher-student interactions and enrich classroom transactions.

- **Web Based Induction Programmes for Elementary Teacher Educators**
  The paper coauthored by Prof. Vasant D. Bhat from RIE Mysore and Smt. Manjula R. From DSERT, Bengaluru describes the Web based induction programme devised by DSERT, Bengaluru, in collaboration ith RIE, Mysore. The paper discusses in detail the objectives, processes and outcomes of this programme. The web page is usable by any elementary teacher educators. The programme has utility for all functionaries of SSA.

- **Enhancing Mental Activities through Abacus: A Low Cost Educational Tool.**
  This paper was presented by Dr. KiranLata Dangwal from Lucknow. The paper discusses use of abacus as a lo cost educational tool for enhancing the mental activity of the child's brain. She describes the functions of abacus, as a teaching tool for calculation as also for activating the brain muscles, thereby facilitating learning ability, speed accuracy, writing skills and also boosts up memory.

- **A study on Impact and Effectiveness of Innovative Programmes under SSA for Children with Special Needs.**
  Several quality improvement initiatives have been undertaken by the states through SSA. Dr. Arvind Sharma, a special educator from Barelly, U.P., discusses and analyses different innovative programmes for Children with Speicial needs (CWSN), implemented by Central and State Governments, NGOs under SSA.

- **E-mentoring and Professional Development**
  The authors of this paper Ms. Divya Sharma, Dr. Indrajeet Dutta from Delhi describe an innovative technique for 'Continuous Professional Development (CMD)' for in-service teachers, called e-mentoring or Web Based Mentoring.System (WBMS). This approach enables work-place based training to teachers and also permits collaboration and networking amongst themselves.

- **Scope of Radio Programmes and Role of Radio Phone-in-Conference in Capacity Building – A Case Study of Karnataka State.**
  This paper was presented by Dr. Patel and Ms. Ansari of MANUU, Hyderabad. The paper provides an overview of the status of radio programmes in the country and highlights their importance in the field of education. The authors have made an attempt to present the design of the radio phone-in-Conference in Karnataka. The programme has been examined as a case study in the educational perspective.

- **Assessment in a Constructivist Learning Environment.**
  In this paper Dr. Harjeet Kaur Bhatia, JMI, New Delhi, discusses assessment in a constructivist classroom, which supports and enhances learning. The first half of the paper describes the emergence of constructivism as a popular paradigm and the latter half elaborates the constructivist assessment process.

CONTENTS

PROFESSIONAL DEVELOPMENT OF TEACHERS IN A NEW PARADIGM OF TECHNOLOGY MEDIATED CONSTRUCTIVIST LEARNING

Dr.H.K.Senapaty [1]

Abstract

In the last two decades, technology has dramatically penetrated into every area of society and, every aspect of social and cultural lives. But, teaching, and other educational endeavours have not taken advantage of these changes. We have largely failed to capitalize on the potential of new technologies, and particularly digital technology as a learning tool. We have allowed our schools to remain in the past, while our children have been born in the future. In the classroom we present knowledge to our children in a linear, didactic manner that differs dramatically from the children's previous experience outside the school. For the children, school is rigid, uninteresting and ultimately alienating. The result is the mismatch between the learner and the educator. But it is not the children who are mismatch to the schools; rather the schools are mismatch to the children. This divergence between our children and our educational practice needs a drastic educational reform that will bring the classroom into line with society. Only by revising educational practices, we can close this gap, and reunite our schools with our children and the rest of our society. To achieve this, there is an urgent need of introducing technology mediated constructivist learning environment for the professional development of teachers. Teacher should be a master learner, and student should be a good learner. Teachers, like doctors, must remain current in their knowledge base and critical understandings. Teacher must know the most current research and practice which can be used effectively to match particular teaching procedures. Such goals are not easy to achieve. It requires the re-organization of the pre-service and in-service teacher education programmes as well as the school system keeping in view the new pedagogy and challenges of globalization.

Introduction

Information and Communication Technologies (ICTs) have the potential to transform the nature of education- the role of the teacher, student, learning process and the curriculum. Education systems around the world are under pressure to use the digital technology to teach students the knowledge and skills they need in the 21st century. The 1998 UNESCO World Education Report, *Teacher and Teaching in a Changing World,* describes the radical implications the Information and Communication Technologies (ICTs) have for conventional teaching and learning. It predicts the transformation of teaching learning process and the way teachers and learners gain access to knowledge and information.

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[1] Professor, Department of Education, RIE, NCERT, Bhubaneswar-751022

With the emerging digital technologies, the teaching profession is evolving from teacher-centred, lecture-based instruction to student-centred interactive learning environments. In order to take full advantage of digital technology in teaching learning, it is essential that pre-service and in-service teachers should effectively use these new tools of learning. Teacher education institutions and programmes must provide the leadership to the pre-service and in-service teachers in this direction.

To accomplish this goal requires both a change in the traditional views of the learning process and an understanding of how the digital technology can create new learning environments in which students are engaged learners, able to take greater responsibility for their own learning and constructing their own knowledge. Now there is widespread concern that the educational experiences provided in many schools will not prepare students well for the future. It is believed that creating a paradigm shift in view of the learning process, coupled with the application of digital technology, may play an important role in bringing educational systems into alignment with the emerging knowledge-based, information rich and technologically advanced society.

Theories Supporting the Constructivist Learning Process

The student-centred learning has emerged based on cognitive learning research and the confluence of several theories that have developed our understanding of the nature and context of learning. In student-centred environment the learner interacts with other students, the teacher, information resources, and technology. The learner engages in authentic tasks in authentic contexts using authentic tools and is assessed through authentic performance. The environment provides the learner with coaching and scaffolding in developing knowledge and skills. It provides a rich collaborative environment enabling the learner to consider diverse and multiple perspectives to address issues and solve problems. It also provides opportunities for the student to reflect on his or her learning.

Although the new learning environment can be created without the use of technology, it is clear that ICTs can provide powerful tools to help learners access vast knowledge resources, collaborate with others, consult with experts, share knowledge, and solve complex problems using cognitive tools. ICTs also provide learners with powerful new tools to represent their knowledge with text, images, graphics, and video.

The new view of the learning process is based on research that has emerged from theoretical frameworks related to human learning. In this view, learners are active agents who engage in their own knowledge construction by integrating new information into their schema or mental structures. The learning process is seen as a process of "meaning-making" in socially, culturally, historically, and politically situated contexts. In a constructivist learning environment, students construct their own knowledge by testing ideas and approaches based on their prior knowledge and experience, applying these to new tasks, contexts and situations, and integrating the

new knowledge gained with pre-existing intellectual constructs. Some of the most influential theories that relate to the new views of the learning process includes Vygotsky's sociocultural theory, Piaget's cognitive development theory and Bruner's learning theory.

Vygotsky's Sociocultural Theory

Vygotsky's sociocultural theory of human learning describes learning as a social process and the origination of human intelligence in society or culture. The major theme of Vygotsky's theoretical framework is that social interaction plays a fundamental role in the development of cognition. Vygotsky believed every thing is learned on two levels. First, through interaction with others, and then integrated into the individual's mental structure.

Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (inter-psychological) and then inside the child (intra-psychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals (Vygotsky, 1978, p.57).

A second aspect of Vygotsky's theory is the idea that the potential for cognitive development is limited to a "zone of proximal development" (ZPD). This "zone" is the area of exploration for which the student is cognitively prepared, but requires help and social interaction to fully develop (Briner, 1999). A teacher or more experienced peer is able to provide the learner with "scaffolding" to support the student's evolving understanding of knowledge domains or development of complex skills. Collaborative learning, discourse, modeling, and scaffolding are strategies for supporting the intellectual knowledge and skills of learners and facilitating intentional learning. The implications of Vygotsky theory are that learners should be provided with socially rich environments in which to explore knowledge domains with their fellow students, teachers and outside experts. ICTs can be used to support the learning environment by providing tools for discourse, discussions, collaborative writing, and problem-solving, and by providing online support systems to scaffold students' evolving understanding and cognitive growth.

Jean Piaget'S Theory Of Cognitive Development

Based on his research on the development of children's cognitive functions, Piaget's work is regarded by many as the founding principles of constructivist theory. He observed that learning occurs through adaptation to interactions with the environment. Disequilibrium (mental conflict which demands resolution) gives rise to Assimilation of a new experience, which is added to the existing knowledge of the learner, or to Accommodation, which is modification of existing understanding to provide for the new experience. Specifically, Piaget posited that the existing cognitive structures of the learner determine how new information is perceived and processed.

If the new information makes sense to the existing mental structure of the learner, then the new information is incorporated into the structure (i.e., Assimilation). If, however, the data are very different from the existing mental structure of the learner, they are either rejected or transformed in ways so that it fits into the structure (i.e., Accommodation). The learner has an active role in constructing his or her own knowledge in both of these ideas. He observed that, as children assimilated new information into their existing mental structures, their ideas gained complexity and power, and their understanding of the world grew in richness and depth. These ideas are core concepts of the constructivism view of the learning process (Jean Piaget Society, 2001).

Jerome Bruner's Learning Theory

Bruner, similar to Piaget, emphasized that learning is an active process in which learners construct new ideas or concepts based upon their prior knowledge and experience. He identified three principles to guide the development of instruction. These include: (1) instruction must be concerned with the experiences and contexts that make the student willing and able to learn (readiness); (2) instruction must be structured so that the student can easily grasp it (spiral organization); and, (3) instruction should be designed to facilitate extrapolation and/or fill in the gaps (going beyond the information given).

Characteristic of Constructivist Learning

- Goals and objectives are derived either by the learner or in negotiation with the teacher or system.
- Teacher plays the role of facilitator, guide monitor and coach.
- Learner plays a central role in mediating and controlling learning.
- Knowledge construction and not reproduction is emphasized.
- Knowledge construction takes place in individual contexts and through social negotiation, collaboration and experiences.
- Learners' previous knowledge, beliefs and attitudes are considered in the knowledge construction process.
- Learning environments are created where activities, opportunities, tools are provided to encourage meta-cognition, self-analysis, self-regulation, self-reflection and self-awareness.
- Content, skills, tasks and learning situation are relevant, realistic, and authentic and represent the natural complexities of the 'real world'.
- Primary sources of data are used to ensure authenticity and real-world complexity.
- Problem-solving, critical and creative thinking skills and deep understanding are emphasized.
- Wrong answers provide the opportunity for insight into students previous knowledge construction.
- Learners are encouraged to explore the new knowledge independently and to manage the pursuit of their goal.

- Learners are provided with the opportunity for apprenticeship learning in which there is an increasing complexity of tasks, skills, and knowledge construction.
- Conceptual interrelatedness and interdisciplinary learning are emphasized which reflect knowledge complexity.
- Collaborative and cooperative learning are focused in order to expose the learner to alternative viewpoints and encourage social interaction.
- Scaffolding facilitate to enable students perform just beyond the limits of their ability.
- Assessment is interwoven with teaching.

Model To Highlight The Three Crucial Processes In Constructivist Learning

Constructivist learning depends on the activation of several cognitive processes in the learner during learning, including selecting relevant information, organizing incoming information, and integrating incoming information with existing knowledge. This is called as the **SOI model** to highlight three crucial cognitive processes in constructivist learning: S for selecting, O for organizing, and I for integrating (Mayer, 1996). Constructivist theory focuses that knowledge is constructed by the learner in working memory. In this construction process the learner uses both incoming material from the environment and prior knowledge from long-term memory. The SOI model is a theory of learning that can be used to generate instructional implications.

SOI model

Instructional message   **working memory**   **Long-term memory**

Pictures   Images   Visual mental model

Selecting   Organizing

Prior knowledge

Words   Sounds   Verbal Mental Model

Selecting   Organizing
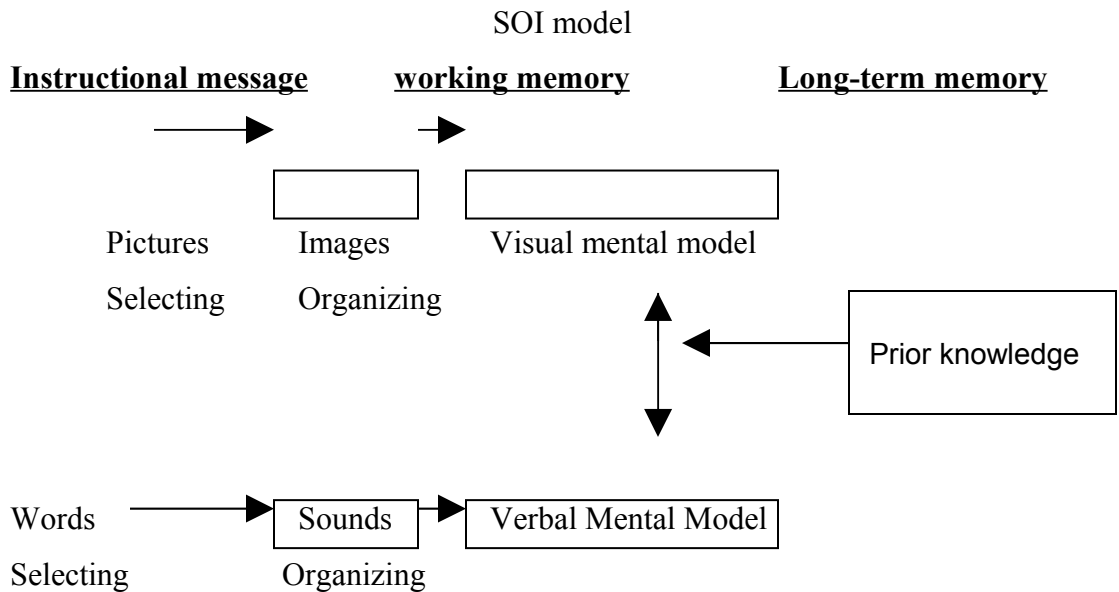
Selecting relevant information: The first process is the selection of relevant information for further processing. When words and pictures are presented to learn in an instructional message, the learner represents them briefly in sensory memories, because of the limited capacity of the human information-processing system. Only

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some of these representations can be retained for further processing in working memory.

Organizing incoming information: The next process involves organizing the selected auditory representation into a coherent verbal representation and organizing the selected images into a coherent pictorial representation. In this process the retained visual images are connected by appropriate links (such as cause and effect) and retained verbal representations are connected by appropriate links (such as cause and effect). This activity takes place in working memory. The outcome of this process is the construction of a coherent pictorial representation and a coherent verbal representation.

Integrating incoming information: In the third process, students make one-to-one connections between corresponding elements of the pictorial and verbal representations they have constructed using prior knowledge.

A final step in learning process is encoding, in which the mental representations constructed in working memory are stored in long-term memory for permanent retention.

Learning Revolution

Mayer (1992) has shown how three views of learning have emerged during the past 100 years of research on learning (i) learning as response strengthening (ii) learning as knowledge acquisition (iii) learning as knowledge construction. According to the first view, learning occurs when learner strengthens or weakens an association between a stimulus and a response. This first view i.e. learning as response strengthening developed in the first half of 20th century and was based largely on the study of animal learning in artificial laboratory settings. The role of learner is to passively receive rewards and punishments, whereas the role of instructor is to administer rewards and punishments, such as drill-and-practice. The instructional designer role is to create environments where the learner repeatedly is cued to give a simple response, which is immediately followed by a feedback.

The second view, learning as knowledge acquisition is based on the idea that learning occurs when a learner places new information in long-term memory. This view developed in 1950s, 1960s and 1970s and was based largely on the study of human learning in artificial laboratory settings. The role of the learner is to passively acquire information, and the teacher's job is to present information, such as in textbooks and lectures. According to this view, information is a commodity that can be transmitted directly from teacher to learner. The instructional designer's role is to create environments in which the learner is exposed to large amount of information through textbooks, lectures and computer based multimedia programmes.

The third view, learning as knowledge construction, is based on the idea that learning occurs when a leaner actively constructs a knowledge representation in working

memory. This view emerged in 1980s and 1990s and was based on largely on the study of human learning in increasingly realistic settings. According to this view, the learner is a sense maker, whereas the teacher is a cognitive guide who provides guidance and modeling on authentic academic tasks. The instructional designer's role is to create environments in which the learner interacts meaningfully with academic material, including fostering the learner's processes of selecting organizing and integrating information.

The Traditional View Of The Learning Process

The existing view of the learning process emerged out of the factory model of education at the turn of the 20th century and was highly effective in preparing large numbers of individuals with skills needed for low-skilled positions in industry and agriculture. The UNESCO Information and Communication Technologies in Teacher Education (2002) notes that the traditional educational paradigm is often characterized by the following views of learning:

- Learning is hard.
- Learning is based on a deficit model of the student.
- Learning is a process of information transfer and reception.
- Learning is an individual/solitary process.
- Learning is facilitated by breaking content/instruction into small isolated units.
- Learning is a linear process.

New Paradigm of The Learning Process

The UNESCO Information and Communication Technologies in Teacher Education (2002) notes that in contrast to the traditional teaching-learning paradigm, a new paradigm of the teaching-learning process is emerging based on three decades of research in human learning that encompasses the following views of the human learning process:
- Learning is a natural process.
- Learning is a social process.
- Learning is an active and not a passive process.
- Learning may either be linear or non-linear.
- Learning is integrative and contextualized.
- Learning is based on a strength model of student abilities, interest, and culture.
- Learning is assessed through task completion, products, and real problem solving of both individual and group efforts.

A Paradigm Shift: From Teaching to Learning

A shift from teacher-centred instruction to learner-centred instruction is needed to enable students to acquire the new 21st century knowledge and skills. The following

table (Sandholtz, Ringstaff, and Dwyer, 1997) identifies the shift that will take place in changing from a focus on teaching to a focus on learning.

Table 1.1 Teacher-Centred and Learner-Centred Learning Environments

Classroom activity	Teacher-centred, Didactic	Learner-centred, Interactive
Teacher role	Fact teller, Always expert	Collaborator, Sometimes learner
Instructional emphasis	Facts memorization	Relationships, Inquiry and invention
Concepts of knowledge	Accumulation of facts, Quantity	Transformation of facts
Demonstration of success	Norm referenced	Quality of understanding
Assessment	Multiple choice items	Criterion referenced, Portfolios and performances
Technology use	Drill and practice	Communication, access, collaboration, expression

Shifting the emphasis from teaching to learning can create a more interactive and engaging learning environment for teachers and learners. This new environment also involves a change in the roles of both teachers and students. As shown in Table 1.2 (adapted from Newby et al., 2000), the role of the teacher will change from knowledge transmitter to that of learning facilitator, knowledge guide, knowledge navigator and co-learner with the student. The new role does not diminish the importance of the teacher but requires new knowledge and skills. Students will have greater responsibility for their own learning in this environment as they seek out, find, synthesize, and share their knowledge with others. ICTs provide powerful tools to support the shift to learning centred education and the new roles of teachers and students.

Table 1.2 Changes in Student and Teacher Roles in Learner-Centred Environments

Changes in Teacher Role	
A shift from:	*A shift to:*
Knowledge transmitter, primary source of information, content expert, and source of all answers	Learning facilitator, collaborator, coach, mentor, knowledge navigator, and co-learner

Teacher controls and directs all aspects of learning	Teacher gives students more options and responsibilities for their own learning
Changes in Student Role	
A shift from:	*A shift to:*
Passive recipient of information	Active participant in the learning process
Reproducing knowledge	Producing and sharing knowledge, participating at times as expert
Learning as a solitary activity	Learning collaboratively with others

(Table adapted from Newby et al., 2000).

Changing Roles Of Student, Teacher And Community In Learning Centred Education (Students as Teachers)

The age of the teacher as the primary source of knowledge in the classroom is gone. Today, with the universe of experts and information available through the Internet, students can access new and relevant information not yet discovered by their teacher. Internet-using educators are discovering a new mode of learning that we call "Side-by-side learning." It is becoming a more and more common experience to find students assuming both informal and formal roles as teachers of their peers and younger students, and in many cases of teachers.

Teacher as Coaches

Teachers who involve their students in project-based learning activities also find their own role logically and naturally changing. Rather than being simple dispensers of knowledge, they discover their primary tasks are to guide and coach and mentor their students. They teach their students how to question, and how to develop hypotheses and strategies for locating information. They become co-learners as their students embark on a variety of learning projects, which chart unfamiliar territory.

Community As Guide And Mentor

With the growth of the World Wide Web, more and more of "the community" can be found online, therefore permitting closer relationships between people inside schools and outside in the "real world". Parents, business leaders, scientists, political leaders and administrators, and many other members of the community can play more effective and innovative roles as motivators, role models, sources of information, critics, evaluators, guides, and mentors.

Instructional Role Of Information And Communication Technologies

Information and Communication Technology alone, of course, does not produce learning; technology is a tool that can be used in many ways, to enhance learning. The literature generally describes three major categories of instructional use for computer-based technologies; learning from the technology, learning about the technology and learning with the technology.

Learning From The Technology

When technology is used to convey specific information or skills, Zucchermaglia (1991) describes it as "full" technology--full of information to be conveyed to the student. Maddux, Johnson, and Willis (1997) label applications that support this use as Type I applications, which are "designed to make it easier, quicker, or otherwise more efficient to continue teaching the same things in the same ways we have always taught them" (p. 18). Use of technology in this case mirrors traditional classroom practice: users are relatively passive, the content and interaction between the user and the software are predetermined, and there is a limited repertoire of acceptable responses. The acquisition of facts through repeated practice and rote memory, or learning from the technology (Jonassen, 1996), is the goal of instruction. This use of technology was the most prevalent one in the 1970s and 1980s (Jonassen, 1996).

"Full" or Type I technologies include computer assisted instruction, integrated learning systems, computer-based tutoring systems, assessment software, and administrative software, such as electronic grade books or attendance record- keeping software. Computer-assisted instruction and integrated learning systems have been readily adopted in many schools as they closely match the traditional routine of classroom life. McClintock (1992) points out that technology has often been used as a replacement for existing tools, such as books, rather than as an alternative medium through which different tasks might be performed and different objectives might be achieved. Some researchers (Vockell and Schwartz, 1992; Merrill, Tolman, Christensen, Hammons, Vincent, and Reynolds, 1986) suggest that computer-assisted instruction can increase achievement because it leads to automaticity of lower-level skills through extended practice. A computer that is endlessly patient with the learner monitors this practice. In the tutorial form of computer-assisted instruction, the computer provides additional information to the learner if an incorrect answer is supplied. This continues until the learner is successful.

Hundreds of research studies have been conducted regarding the effects of computer-assisted instruction (CAI). From his analysis of twelve meta-analyses of the effectiveness of computer-based instruction programs developed primarily prior to 1990, Kulik (1994) concludes that students usually learn more and in less time with computer-based instruction. Becker (1992), however, found numerous methodological problems with many studies that have demonstrated positive effects of using CAI. In his meta-analysis of 100 studies, he concludes that differences in CAI users and non-users are too small to have educational significance.

Learning about the Technology

Another use of technology in schools that exemplifies traditional learning environments includes learning about the technology itself (Jonassen, 1996). Classes in computer programming and computer literacy are designed to teach students how computers work. Students learn specific skills related to using the computer, such as keyboarding skills, ethical uses of computers, or a particular programming language, but these skills are not tied to other content. These classes were prevalent in the 1980s, but Jonassen (1996) observes that this use of technology is now less emphasized in schools. He attributes the change to:

- the increasing availability of computers in society that gives students more experience with them outside of schools;
- the understanding that one does not have to know how a computer works to take advantage of it as a tool; and the
- emphasis on memorizing vocabulary about computers in computer literacy classes, which had little applicability to educational goals of schools.

Learning with the Technology

Learning with technology drives much of the current thinking about the use of technology to support learning (Jonassen, 1996). Bonk, Hay, and Fischler (1996) note, "Currently popular ideas about students using electronic tools to be designers of knowledge are akin to Dewey's arguments that children must actively construct and interrelate knowledge by learning in more authentic ways" (p. 95). According to this perspective, when technology becomes an integral part of the classroom learning environment it provides a tool for both teachers and students that can facilitate new roles and new instructional strategies.

Technology used as a tool can serve as a means to seek and process information, and to reflect on one's understandings, beliefs, and thinking processes. Used in this way, technology is "empty" as it allows the learner to enter information and explore new content relationships (Zucchermaglia, 1991). Ordinary application software such as word-processing, spreadsheet, graphics, presentation, and database software; problem-solving software; simulations; electronic mail; and the Internet are technology tools that fit into this category. These applications, labeled Type II by Maddux et al. (1997), give the user control of almost everything that happens, including the interaction between the user and the machine. An extensive repertoire of acceptable responses is provided for. Rather than rote memorization of facts, Type II applications encourage the accomplishment of creative, higher-level tasks (Maddux et al., 1997).

Because of the interactive nature of technology and the power of its information-processing capabilities, Jonassen (1996) proposes that when students learn with technology, it becomes a "mindtool." He defines mindtools as "computer-based tools and learning environments that have been adapted or developed to function as

intellectual partners with the learner in order to engage and facilitate critical thinking and higher-order learning" (p. 9). Using commonly available software (databases, spreadsheets, electronic mail, multimedia, hypermedia, and others), learners employ technology to both construct and represent knowledge.

The following discussion examines how technology can be used to support the creation of classroom environments based on the instructional implications of constructivist learning theory. This discussion is based on the premise that it is learning with, not from or about, technology that makes computer-based technologies important tools in a constructivist learning environment.

Technology And The Instructional Implications Of Constructivism

The literature suggests that technology can support constructivist learning environments when technology is used as a tool for learning, rather than the object of instruction or as the instructor It can assist the teacher to uncover students' prior knowledge, understanding and beliefs; base instruction on the posing of problems; increase the complexity of the context; take on the role of the facilitator; increase the ability of students to test multiple scenarios and thus challenge preconceived notions and misconceptions: and, broaden the circle of social interaction to include students' peers and experts beyond the classroom, the school, the community and even their own country.

Constructivism transforms the student from a passive recipient of information to an active participant in the learning process. Always guided by the teacher, students construct their knowledge actively rather than just mechanically acquiring knowledge from the teacher or the textbook. Students become engaged by applying their existing knowledge and real-world experience, learning to hypothesize, testing their theories, and ultimately drawing conclusions from their findings. Its primary goal is helping students learn *how to learn*.

Internet technology has made a substantial contribution to education. The emphasis now continues to shift from Computer Based Learning (CBL) and its related methods such as Computer Assisted Instruction (CAI) to Internet Based Learning.

There appear to be two main options. One is a form of distance learning in which a teacher places course-materials on a web server, which can be accessed by remote students. This approach follows a prescriptive pattern. It allows all the teaching materials to be validated at source and integrated into the course. However, it may be an expensive way to provide enough software to meet the demands of complete syllabus. The alternative is a type of independent study in which learners search the internet for materials that are relevant to their interests. This is a more constructive process that can provide access to a media range of course-ware and multiple views of a subject area but the suitability of the material for a taught course cannot be guaranteed.

These two modes can be combined to form a more general approach that may be described as Internet Based Learning (IBL). It includes any process in which a learner is provided with access to course-materials stored on the Internet. It requires a model of teaching that combines the advantages of both prescriptive and constructive learning by selecting appropriate materials and admitting a wide range of views of a subject. It should facilitate a learning style that has been described as **guided discovery**.

Internet information is usually accessed through the hypertext protocols of World Wide Web. Some authors are of the opinion that an unstructured presentation is more conducive to learning by forcing the learner to construct a personal knowledge map. Others prefer to offer more direction in the form of a navigable interface that relates to the structure of the subject. Both views have their merits, but for an open learning system such as the Internet a structured interface appears to be more appropriate.

The most widely used information structure is that of object oriented hierarchy. This model is popular because it appears to reflect the way people assimilate and process information. Books have such structures with object forming a hierarchy of chapter, section and smaller components and a user interface in the form of a content page. More appropriately, computer filing system and user interface such as that of Microsoft windows have object-oriented structures. From the point of view of constructivist theory the wide use of concept maps and schemes supports the view that personal knowledge is either object oriented or can be related to information having such a structure.

Instructional Approaches for Technology Mediated Constructivist Learning

Constructivist learning theory suggests that teachers must understand what learners bring to the learning situation and begin there in helping students build new knowledge. For example, students can use word-processing software or e-mail to share their understandings with student peers as well as teachers. These uses of technology have been demonstrated to improve writing skills, produce more and better ideas for decision making, and increase motivation (Center for Applied Special Technology, 1996; Chun, 1994; Cohen and Riel, 1989; Honey and Henriquez, 1996; Mabrito, 1992; Moore and Karabenick, 1992; Naiman, 1988; Olaniran, 1994).

Technology can help to make students' thinking processes more visible to the teacher, something that does not happen when students simply turn in a completed assignment for checking and grading. As teachers observe their students working with computer applications, they can see the choices each student is making, stop and ask about the student's goals, and make suggestions for revisions or different strategies (Means and Olson 1997, p. 126-127).

One technology particularly suited to this process is Computer Supported Intentional Learning Environments (CSILE), developed by researchers at the Centre for Applied Cognitive Science (Ontario Institute for Studies in Education). CSILE is a software-

based tool that provides a means for students to build a collective database (knowledge-base) of their thoughts, in the form of pictures and written notes. CSILE stores the thoughts entered by each student and makes them available for everyone, the system is a form of hypermedia that allows notes entered as text, drawings, graphs, and timelines to be retrieved, linked, commented on, rated, and so forth. (Scardamalia, Bereiter, McLean, Swallow, and Woodruff, 1989, p. 52)

Students enter what they already know about a topic at the beginning of the creation of a CSILE database. This provides a tool for the teacher both to identify prior knowledge and to document the process of knowledge construction. Using CSILE, students can create and label written notes in a variety of ways. (Scardamalia et al., 1989, p. 52).

Knowledge mapping software is designed to capture and organize brainstorming and idea generation sessions into concept or knowledge webs. This is a useful technology to help teachers uncover students' existing knowledge about a topic. For example, the teacher can pose a problem or suggest a content topic to students. Using the software, students can create a diagram of ideas, consisting of one or a few words, connected by "links," which may be lines or arrows or a text label. These webs of ideas may be linked to other webs, links may be changed easily, and notes may be added to each idea on the web. All of these elements may also be converted to an outline format (Neuburg, 1997). As the teacher examines the webs or diagrams created by students, a visual representation of their prior knowledge is available for analysis.

Hypertext and hypermedia may be used by students in a like manner for assembling and linking information to present their understanding of almost any topic. Hypermedia is software built on non-linear interrelationships among text and other elements. When text is linked to related text using programming commands, it is called hypertext. By adding elements that allow the user to move through text, images, and sound, a hypermedia environment is created. Hypertext and hypermedia are structured so that the user accesses information in ways that are meaningful to him or her (Jonassen, 1996) rather than through a linear presentation. As students create hypermedia stacks, their existing knowledge is represented.

Simulation software also offers an opportunity for uncovering and examining student prior knowledge. "Simulations put the student in an active role in an environment that has a set of rules", (Maddux, et al., 1997, p. 219). As a student begins to interact with a simulation, prior knowledge guides the choices he/she makes when selecting from the options offered. Observing the choices made as the student begins the simulation and discussing the reasons for those choices provides a rich opportunity for both the teacher and the student to explore the student's prior knowledge.

In addition to the prior knowledge and understanding students bring to the learning situation, they also bring interests. As noted previously, teachers who create learning environments that enable the learning process structure activities build on students' current interests. Technology can be used to help identify those interests. Allowing

students to create hypermedia stacks or to use knowledge mapping software to create idea webs about self-selected topics can provide teachers a clearer picture of students' interests. However, teachers cannot respond to the multitude of student interests due to lack of resources available in the classroom or the school. Technology can provide access to resources that build on students' interests (Irving, 1991; Riel, 1994; Swan and Mitrani, 1993). Databases of information available on CD-ROM or on the Internet, however, allow students to examine a multitude of topics that may be of unique interest to an individual student (McDaniel and McInerney, 1992).

Means and Olson (1997) found technology can support teachers' efforts to engage students in long-term, complex projects by dramatically enhancing student motivation and self-esteem, making obvious the need of longer blocks of time, creating a multiplicity of roles, leading to student specialization in different aspect of technology use, instigating greater collaboration, and giving teachers additional impetus to take on a coaching and advisory role. Numerous other studies have demonstrated the increased motivation and engagement of students when they use technology (Dimock, 1996; Deal, 1995; Ferneding-Lenert and Harris, 1994; Harasim, 1989; Lowry et al., 1994; Mason, 1989; Moore and Karabenick, 1992; Ross et al., 1990; Ryser et, 1995; Sandholtz et al., 1997; Velayo, 1993; Williams, 1995).

Impact of Collaboration In Technology Based Collaborative Learning

The impact of collaboration in technology based collaborative learning environments on study performance and nature and quality of knowledge construction has been studied by researchers (Schellens, 2004; Schellens and Valcke,200o,2002, Schellens, Van Keer, and Valcke, 2004a, 2004b, reported by Valcke, M. *et al.* 2005)

In the first study, 300 of 850 freshman students studying psychology and educational sciences participated. They worked four months in 38 asynchronous discussion groups on authentic task and problems in which they applied the theoretical base of different instructional theories. Group size was manipulated in this study. The complete transcripts of nine groups were analyzed to determine levels of knowledge construction reflected in these messages. The results of this study confirm the task related nature of the group communication. Building on the hypothetical hierarchical nature in the levels of knowledge construction, the results further reveal higher proportions of phases of knowledge construction in all groups. As to the group size, smaller groups (8-10 students) reached significantly higher levels of knowledge construction than average size (11-13) and large groups (15-18).

In a subsequent study, 230 freshmen worked in 23 asynchronous discussion groups as a formal part of their curriculum. Group size was constant in this study (10 per group) and the focus was on determining the impact of task structure (Global task versus pre-structured task) and participation levels (three levels, based on the number of observed contributions in the group discussions) on knowledge construction. Complete transcripts of eight randomly selected discussion groups were analyzed. The results again confirm the highly task oriented nature of the discussions.

Discussions in more actively engaged groups (reflecting the highest participation level) show significantly higher level of knowledge construction. The findings also hint at a significant impact of task structure. More complex tasks foster higher levels of knowledge construction.

In the third study, with 286 students, multi-level analysis was applied to determine the impact of individual student characteristics (i.e., positive attitude towards collaborative learning; deep, surface, or strategic learning style; participation level). And task characteristics (i.e., role assignment, task complexity) on two dependent variables, namely level of knowledge construction and study performance. To determine the level of knowledge construction, the same models were applied to code the transcripts as in the second study. With respect to the in-depth exploration to the task environment, task complexity (availability of conceptual base and availability of a solution procedure) was measured and considered to have a differential impact.

The results of this study point at the impact of task complexity. When tasks are too complex, the levels of knowledge construction are significantly lower. On the other hand, when the tasks are too straightforward, the number and quality of constructions drop significantly. The results confirm the earlier findings that a task should be in the learners' zone of proximal development (Schellens *et al*., 2004a; Quinn, 1997). With respect to the impact of roles, only the role of the 'summarizer' resulted in significantly higher levels of knowledge construction. Considering the results of the multi-level analysis dealing with student, group, and task variables, a large part of the overall variance in students' level of knowledge construction can be attributed to differences between the various discussion themes and tasks. As to the impact of student characteristics, the amount of individual contributions and students' attitude towards the online learning environment are significant predictors of students' mean level of knowledge construction.

The findings of the above studies are largely in line with the results of studies that fit into the long tradition of collaborative and cooperative learning research (Johnson and Johnson, 1994 and Slavin, 1995. The research results reveal that task structure is an important issue to consider for developers of such environments. A careful balance should be respected between open and closed structure of discussion. Along with task structure, task complexity is also a significant factor. Tasks should not be too complex as students' motivation might decline. Illera (2001) states that motivation also implies that students are capable of seeing that they can complete the activity that is within their zone of proximal development and that it is something attainable. On the other hand, when tasks are too straightforward, we might expect that students experience no challenge and that the quality of contributions also drops. It appears that challenge is an important concept in this context. In order to keep the learning in this zone of proximal development, focus should be laid on structuring of assignment. Another practical implication is that task should be enjoyable.

These strategies are consistent with constructivist approaches to learning and instruction to foster engagement in an online learning environment. Present

achievable goals and clear evaluation criteria, organize authentic learning, and set tasks at the appropriate level of complexity.

A Framework for Creating a Learning Environment for the Professional Development of Teachers

We can create a learning environment by integrating constructivist theory and information and communication technologies into our educational institutions. This will be made possible by:
- developing greater motivation among the teachers,
- making workforce more flexible and creative,
- reducing isolation among teachers,
- making teacher a facilitator of knowledge construction,
- improving social interaction,
- sharing knowledge,
- sharing responsibility for the total development of students and collective responsibility for students' success,
- developing interdependency and interdisciplinary approach,
- breaking down the traditional communication barriers,
- changing the role of the student, teacher and community,
- providing access to the information resources and focusing on learning with technology , and
- encouraging innovation and creativity in our educational institutions.

Conclusion

Professional development of teachers is imperative to capitalize on the potential of new technology, and particularly digital technology as a learning tool. Professional development should enable the teachers to construct professional knowledge about pedagogy, content, and technology, as well as strategies for managing the changing classroom environments brought about by the creation of constructivist learning environments supported by technology. To achieve this, teaching should be given appropriate learning experiences. These experiences should be situated in an authentic context for teachers, their school and classroom. It should build on their prior knowledge and provide opportunities for social interaction with colleagues. It should begin with investigation of problems supported by technology that are relevant to teachers. Such learning experiences enable the teachers to create learning environment appropriate for the children of the Information Age.

Teachers, like doctors, must remain abreast with their professional knowledge base and critical understandings. Teachers must have sound understanding of contemporary research and practice which can be used effectively to create conducive teaching-learning environment for children with particular needs. Such goals are not easy to achieve .It requires the reorganization of the pre-service and in-service teacher education programmes as well as the school system. Teachers need to be convinced that their discipline contains an infinite number of possibilities for theoretical

deepening and technical improvement. The teacher understands that he/she himself/herself can make hi/her works a meaningful one, play a vital role for the professional development of the teacher.

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ONGOING TEACHER FACILITATION (ENGLISH LANGUAGE) THROUGH TELECONFERENCING: THE KARNATAKA EXPERIENCE

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Abstract

In order to provide continued support to teachers teaching English in classes 1-4 SSA, Karnataka thought of making use of teleconferencing facilities available in all the blocks. In all, ten teleconferences were held, five in 2007-08 and 5 in 2008-09. Every month different aspects of English of classes I-IV English were taken up for discussion. Clippings were shown, demonstrations were given and reading material was given through tele-modules. Teachers discussed their doubts with the panellists. Every month they came back with their classroom experiences, reflected over their own practices, shared success stories and learnt new techniques. In the year 2007-08 about 55,000 teachers across the state participated in the teleconferences. In 2008-09 about 100,000 teachers participated. The experiences of providing such on going support have been very enriching. Teachers, who almost opposed the programme saying that it is not practical, came to accept it as something that they could do with minor modifications.   The sustained support has helped in shaping teacher attitudes more than anything. Sharing of experiences has been a motivating force. It was found to be quite useful and DSERT has now taken up Nali-Kali training programmes on the same lines. There are many changes to be done. Quite a number of insights have been generated on organising such programmes. This paper describes in detail the processes of organising such on going facilitation making use of teleconferencing facilities.

Introduction

Government of Karnataka implemented a programme facilitating the learning of English in classes 1-4 from the year 2007-08. The basic focus of this programme was to provide exposure to the learning of English right from class I so that when learners begin formal learning of English at Class V, they are better equipped to take on the challenges of learning a foreign language.

Two types of material were thought of by the committee appointed for this purpose. First, a resource book for the teachers and second an activity book for the learners. Further, the learning processes would involve five segments, namely, Stories, Rhymes, Dialogues, Total Physical Response Activities and Language Games.

Reading and writing were not emphasised in the first two years. A sustained exposure to spoken language for two years is expected to lay a sound foundation to the learning of English. The processes envisaged for the classes I – IV English programme were based on the processes of mother tongue (MT) learning at home. A

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child, before beginning with a formal course in his/her MT, has nearly four years of informal exposure to that language. The Classes I – IV English programme hypothesised that if children were provided an organised but informal exposure to English in classes 1-4, they would be very comfortable learning English from class V, where formal learning of English begins.

The Challenge

However, there were about 100,000 teachers across the state teaching classes 1-4. They were not accustomed to teaching English. Nor could the department expect even a working knowledge of English from these teachers. They were not specially trained as language teachers. Then there were queries from the society as to the status of MT teaching in classes I – IV, if English was introduced. This question had to be addressed. The teachers had to be theoretically convinced about the approach and practically convinced about the feasibility of different strategies suggested. They had to be equipped with the necessary language and methodology for implementing this programme. And all these had to be done even as the programme was being implemented.

Teacher education was the most challenging issue before the department. The initial training had been given by the Regional Institute of English South India (RIESI) which included a 3 day teleconferencing followed by a 3 day face to face training. The facilitators for both these programmes were trained by the RIESI. Over a period of 20 days about 100,000 teachers participated in this training programme.

The Need for Providing On Going Support

The initial training given proved to be very inadequate. It was observed by the personnel visiting schools that teachers did not/could not implement the programme as envisaged. The following problems were listed for their inability to implement the programme.

1. Stories are very lengthy. The words used are unknown and strange to Indian context. The culture projected in the stories is not Indian. So neither the teacher nor the students could appreciate it.
2. Rhymes are lengthy and difficult to sing.
3. Language games are difficult to play.
4. Teachers themselves are not capable of speaking English.
5. There was pressure from the parents to teach their wards letters of the alphabet right from the beginning.
6. Even teachers believed that teaching the letters of the alphabet was the first step of teaching English to beginners.

The biggest challenge, as came through the observations and interactions with teachers was that every teacher had some theory of teaching English which was basically influenced by the methods followed in private English medium schools.

Also they were taught English that way when they were students. So it was necessary to convince them that their methodology was not the recommended one.   They had to unlearn whatever assumptions they carried about learning of English.

To address these challenges, it was necessary to provide sustained inputs to teachers. Teachers themselves suggested trainings of longer duration. However, reaching out to more than 100,000 teachers within a short span of time was not possible. Moreover, the problems had to be addressed as early as possible because the academic year had already begun.   The best course of action was to provide some inputs to teachers, allow them to put these inputs into practice and come back for a second round of inputs and so on. However, the Capacity Resource Planning (CRPs) or other local resources could not be relied upon for this purpose because the approach adopted was entirely new to Karnataka curriculum practices. It was important to give the right inputs to teachers. It was at this juncture that teleconferencing was thought of.

Revisiting Teleconferencing For On Going Facilitation

Teleconferences have been dealing with one topic at a time for all these years.   That is how it began and got picked up. However,   the possibilities of this technology still remain open. 'Teleconferencing is bound to see large use in a variety of training situations across the board.' (p.130, DEP-DPEP, IGNOU, 2003).   It is one such possibility that Karnataka has explored in order to provide a sustained support to its teachers teaching English in classes 1-4. The feedback obtained by earlier studies on teleconferencing shows a clear suggestion to conduct teleconferences 3-4 times a year.(DEP-DPEP, IGNOU, 2003). This suggestion was perhaps predictive of using this technology for on going facilitation.

Apart from reaching out to a large number of clientele in one go, the teleconferences that were planned to support Classes 1-4 English programme on a sustained manner had the following features.

1. All the teachers handling Classes I – IV English were expected to be trained.
2. Every month there would be one teleconference. This process was called 'On going Facilitation for teachers of Classes 1-4 English'.
3. The same programme would be repeated as many times as required to cover all the teachers.
4. The 203 ROTs across the state installed in Block Resource Centres (BRCs) and the Receive Only Terminals (ROTs) in District Institute of Education and Training (DIETs) would be used as receiving centres.
5. If necessary the centres would make provision for accommodating two batches of 50 teachers each.
6. As the same programme repeated, the teachers could attend any one of the programmes in a month, though they were expected to be with their batch always.

Objectives

1. To provide segment wise inputs every month in order to help teachers get going with the programme.
2. To answer the doubts raised by teachers about the approach adopted in Classes I – IV English programme.
3. To provide opportunities for the teachers to interact with the state resource team directly and clarify their doubts.
4. To give demonstrations of how different segments are dealt with in the classroom.
5. To provide a forum for the teachers to discuss their good practices with their colleagues across the state.

The Teleconferences

In the year 2007-08, five teleconferences were organised. About 45000-55000 teachers attended these teleconferences. There were in all 3 interactions in a month on the same theme. The repeat programmes were attended by different batches. Basically the teleconferences covered teachers in lower primary schools. However, the teachers handling Classes I – IV English in higher primary schools also needed these inputs. So two separate programmes of two days duration, were organised for them. The material prepared for LPS teachers was given to HPS teachers in a consolidated form.

In the year 2008-09 again 5 teleconferences were organised to train about 1,20,000 teachers across the state, including teachers from aided schools.   The Fridays and Saturdays of Ist week, IIIrd week and IVth week of a month were meant for these tele-interactions.

In all 50(22+28) teleconferences were organized as part of teacher empowerment for ensuring quality implementation of classes I to IV English programme.

The Processes

The Facilitation Team
The team consisted of DIET faculty, English Language Training Centre (ELTC) faculty who formed a standing team and classroom teachers. Involvement of teachers had a positive effect on their colleagues.   The teachers across the state felt that if teachers who were not much different from them could work as panellists and were called good practitioners, why not they? This was evident in the fact that quite a number of teachers from all over the state wrote letters to Department of State Education Research and Training (DSERT) and expressed a desire to be panellists.

In 2007-08 the major focus of the teleconferences was on building confidence and convincing teachers over the methodology suggested. In 2008-09, the organisation of contents in the resource books and activity books became the focus.

The Facilitation Process

Power points slides, clippings and tele top during the teleconference were used for presentation.

The physical infrastructure included two way audio and one way video facility with fax and phone connections. PPTs could be presented, clippings could be played and tele top could also be used for presentations.

The transactions of a day had four sessions.   These four sessions did not have uniform time allotment because of the other EDUSAT relay.   The time schedule for both years is given below.

2007-08	2008-09	Notes
10:30 – 11:45	10:00 – 11:30	
11:45-12:00 – Tea	11:30- 11:45 – Tea	
12:00 – 1:30	11:45 – 1:30	
1:30 – 2:30 – lunch	1:30 – 2:30 – lunch	2:00-2:30 EDUSAT Relay. So this lunch time could not be changed.
2:30 – 3:30	2:30 – 3:30	
3:30 – 4:00 – Tea	3:30 – 4:00 – Tea	Because of EDUSAT relay 30 mts. Tea break. Group work given.
4:00 – 5:30	4:00 – 5:15	Since the programme started early it was wound up by 5:15 in 2008-09

On Saturdays the programme started at 11:00 am because of an EDUSAT relay between 10:00 and 11:00. But there was no other relay during the day. So the time could be adjusted. The programme ended at 5:30 p.m.   However, Saturday batches did lose about 15 minutes. In 2008-09, the programmes were conducted only on Fridays and Saturdays.

The four sessions had their own pattern in terms of inputs given. The different areas dealt with in each of the sessions in 2007-08 and 2008-09 are presented in the following table. In 2008-09 a different schedule was followed to make the programme more effective.

Sessions	2007-08	2008-09
Session 1	Familiarising teachers to the text Features Resource Books and Activity Books- presentations, discussions and tele-interactions over phone and fax.	Familiarising teachers to the text Features Resource Books and Activity Books- presentations, discussions and tele-interactions over phone and fax.
Session 2	Clippings/Discussion Tele-interactions over phone and fax.	Presentation of the main theme – reading, writing, vocabulary development, story telling supported by short activities, along with interview with one teacher, exhibiting Teaching Learning Material (TLM) Interaction
Session 3	Demonstrations of techniques of story telling, language games discussion. Interaction only if time permitted.	Video clippings and discussion. Interaction only if time permitted.
Session 4	Singing rhymes with actions- teachers in the centres sang after the panellists and practised. Tele-interaction over phone and fax.	Singing rhymes with actions- teachers in the centres sang after the panellists and practised. Tele-interaction over phone and fax.

The session on rhymes was essentially a practice session. The panellists recited and sang the rhymes. The participants sitting in receiving centres across the state recited and sang rhymes after the panellists. In two years all the rhymes given in the Resource Books for classes 1-4 were covered.

In the year 2007-08 group activities were suggested. However, the panellists could not ascertain if the activities were carried out in all the centres. In the year 2008-09, in the last three months, very short activities that could be done individually were given. Each activity did not take more than 2-4 minutes. Even as the presentations were going on, the presenter asked the teachers to work out the exercises given in the modules. The continuation of the presentation depended on the completion of these tasks by the teachers. This helped the teachers relate to the topic under discussion better. Later during interaction session teachers clarified their doubts.

The 10 teleconferences, (Once a month repeat programmes in the same month had the same contents.) presented a number of visuals along with different techniques. They were as follows.

- A 40 minute class with 4 segments – One in the beginning and one at the end of the series.
- Story presentations   - 6
- Language games - 6
- Preparation and use of TLM – All sessions
- No. of teachers interviewed - 12
- Studio demonstrations given by panellists covered all areas.

In the beginning, the teachers were compelled to ask questions in English.   But they preferred not to ask questions at all.   Later they were allowed to interact even in Kannada because the major focus was not to teach English but to equip them in terms of classroom strategies with proper theoretical orientation.   Some of them did prefer speaking in broken English.   Their effort to speak English was appreciated.   No comments were made as a rule on the language of the speakers.

The major issues discussed in the interaction session are listed below.   They were questions raised by the participants in various sessions.

1. How can we deal with stories that are of not our culture?
2. How are we to deal with stories that we ourselves don't understand?
3. Our spoken skills are very poor. How can we provide a good exposure to English?
4. Our English is poor. Give us more inputs regarding phonetics, grammar and spoken English.
5. Can we use Kannada while narrating the story?
6. Why can't we start with introducing the letters of the alphabet?
7. What is wrong in starting reading from the letters of the alphabet?
8. Parents demand for written work. How can we satisfy them?
9. We need cassettes or CDs of rhymes and stories so that the students will get the best exposure.
10. Give us more and more demonstration lessons.
11. Isn't it necessary to have evaluation? Do we need to conduct tests for Classes 1-4 English?
12. It is difficult to find time to cover 3 or 4 segments as expected.
13. How can we teach English in multi-grade contexts?

The Support Literature

Each month the participants were given tele-modules which dealt with different strategies for story telling and handling other segments.   New words were glossed.   The following issues were covered in the tele-modules provided as support literature to these teleconferences.

1. Glossary of new words
2. Analysis of activities given in Student's Activity Books
3. Strategies for handling different segments

4. Preparing for story narration
5. Initial reading development
6. Initial writing development
7. Developing vocabulary
8. Short activities to be carried out in the centres
9. Answers to questions asked in the previous session
10. Feedback sheet

The Use of Sms for Asking Questions

These teleconferences also tried out mobile technology for ensuring effective communication between the studio and the centres. The mobiles were used for the following purposes.

1. To send questions through SMS where fax was not available or participants thought of saving time on running around to send a fax message.
2. To send attendance in the centres.
3. To interact with the panellists during off-air time.

One or two mobile numbers were flashed on the TV screen for this purpose. It was noted that even after the teleconferences teachers continued to contact these mobile numbers to get clarifications. Perhaps we need to consider using mobile technology which can instantly connect people as a supplement to teleconferencing.

Reflections

Organisation of the Programmes
The facilitators trained by the RIESI, Bengaluru were asked to facilitate even these teleconferences. However, it was felt that a formal meeting with all the facilitators at the centres would have paid better dividends.

Every month new tele-module had to be prepared based on the feedback of the previous month. This gave very little time for preparation, printing and distribution of the modules. We need to explore the possibility of printing in more than one place. We can also send one copy through email to all the BRCs so that they can get multiple copies of the module. Provision must be made in the budget for these expenses.

A team of panellists could be identified and trained for this purpose. It is possible to have one team of RPs continuing with one batch. This will reduce the work pressure on just one team of about 5 members who have to be present in the studio 6 days in a month for this programme.

Giving short tasks during a presentation appears to be more effective than giving a break for off air activities. When the participants were given short tasks which

could be individually done in a couple of minutes, the involvement was more. Such tasks also helped them personalise learning.

Impact on Teachers/System

1. On going facilitation has opened new avenues before the department for reaching out to large number of teachers on a regular basis. This is evident from the fact that Nali-kali training is being organised on an on going basis in a similar manner. Perhaps we need to streamline these processes and see how best they can be utilised.

2. Networking of teachers across the state seems to have become a reality with these teleconferences. The teachers have exchanged mobile numbers and they were given the mobile numbers of the resource persons. The teachers kept calling the resource persons from all over the state to clarify their doubts. The use of mobile phones for such short interactions is likely to increase in the future more than any other technology. This has a great potential which needs to be exploited in a creative manner.

3. When classroom teachers were interviewed in the teleconferences, such sharing of experiences created more space for interactions between teachers and learning from each other.

4. Constructivist approach is employed in the planning of the classes' 1-4 English programme. There is a gradual shift from what students learn to how they learn. Both the teachers and students are learning. The classroom is becoming learning centred in the true sense of the term.

5. The continued interactions with teachers through teleconferences have initiated them into a self reflective process. Though slow, this is definitely going to influence their professional growth.

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NURTURING TEACHER EMPOWERMENT AND SCHOOL EFFECTIVENESS THROUGH EDUSAT ORIENTED TRAINING PROGRAMME: AN IMPACT STUDY

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Abstract

Teachers' professional development refers to the process that encourages and enables them to acquire the set of knowledge, skills, values and behaviours which are essential for them to perform their various expected professional roles in the classroom, school and society. Since teachers are the key persons in bringing desirable innovations in classrooms and making teaching-learning process effective and useful, they have to be trained and oriented in the modern concepts of school organisations, new methods of teaching, preparation and use of information and communication technologies (ICT) and audio-visual aids, trying out action research studies, carrying out experiments and maintaining better school-community relations.

Introduction

The 2001 resolution of the Indian parliament to treat 'Education' as the fundamental right of each citizen of the country required massive mobilization of intellectual, infrastructural and technological resources to achieve the goal of education for all (EFA) by the year 2010. Continuous interventions have been undertaken through workshops, radio and television programmes and tele-conferencing activities for professional development of the teachers. While information and communication technology (ICT) is being used for professional development of the teachers, they are also exposed to basic skills required for teaching-learning through ICT.

Teachers occupy an unchallengeable position in the educational process. They play a vital role in all round development of the personality of children by exercising their personal influence. Efficient teachers are likely to encourage and motivate their learners to move to the more effective forms of learning activity. Good teachers can help to inspire intellectual curiosity in their students, which will allow them to value learning.

Teaching requires mastery over a body of knowledge to be taught as well as the development of personal knowledge about what is worth teaching and which ways of teaching are relatively more effective. Schools, teachers and teacher educators are being asked to be more accountable for what happens in the classrooms and to ensure that all students meet the ever higher learning standards. At the same time, emerging technologies provide alternatives about how best to educate students, prepare educators, and provide continuing professional education for practicing professionals.

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A teacher is expected to be a lifelong learner. Nobel laureate Rabindra Nath Tagore said, "A teacher can never truly teach unless he is still learning himself. A lamp can never light another lamp unless it continues to burn its own flame." Teacher quality is a point of concern through out the country. Even today our classroom processes are mostly based on chalk and talk. This has to change. All teachers have to be ICT literate. The use of ICT in teaching – learning can enhance the quality of learning, make learners more independent and capable of sustaining their own lifelong learning. It aims at promoting understanding and deep learning as against shallow or surface learning that usually occurs in the conventional mode.

Successful teachers are individuals who are highly self motivated and ready to teach and accomplish challenging teaching learning goals. Teacher educators have to come forward and accept the challenge of preparing technology competent teachers by being role models themselves. During academic monitoring and supervision of the schools, it was observed that in spite of attending a number of in-service training programmes related to professional –skill development of teachers, quite a large number of them were found not doing justice with the profession. Sidhi district of Madhya Pradesh state has been very fortunate to have an ambitious EDUSAT assisted project for quality education at elementary level by the Govt. of India with joint collaboration of MHRD and IGNOU. Since the study is delimited to the efficacy of EDUSAT oriented training programmes for teachers at elementary level in Sidhi district, professional development and empowerment of teachers as well as school effectiveness were assessed.

Objectives

The study was carried out with the following objectives:
1.   To assess the physical and educational facilities in the schools.
2.   To study availability of the equipments of ICT and EDUSAT, their functioning and safety.
3.   To study the availability of the EDUSAT- trained teachers in the schools, and attitude of teachers, students and guardians to the project.
4.   To assess the efficacy and suitability of EDUSAT oriented training programmes for capacity building of teachers and other personnel at elementary level.
5.   To identify the problems faced by the teachers in utilization of EDUSAT programme.
6.   To make the teachers aware of their teaching potentialities and activate them to develop their professional competence.
7.   To suggest some practical measures for effective utilization of ICT and EDUSAT lessons for quality education under Sarva Shiksha Abhiyan (SSA).

Hypotheses

The study was undertaken with the following hypotheses.

H_1. Teachers and teacher educators are not aware of the objectives of the EDUSAT programmes being telecast.

H_2 Quite a good number of schools do not have EDUSAT set in functioning and wherever it is, the lessons are viewed just as formality.

H_3 Teachers are not adequately resourceful, trained and motivated to utilize life like situations for development of communicative skills.

H_4 There exists a significant difference between the academic achievements of students of EDUSAT-functional, and non-functional schools.

H_5 EDUSAT lessons are quite helpful in enhancing the professional competence and teaching skills of the teachers as well as the academic achievement of students.

Delimitation

Due to constraint of time and resources available, the study was delimited to:

1. Teachers trained for successful implementation of Rajiv Gandhi Project on EDUSAT assisted Elementary Education (RGPEEE) in Sidhi district of Madhya Pradesh state.

2. Professional development of the teachers, their awareness, attitude and interest in EDUSAT lessons for students at elementary level.

3. Utilizatioin of EDUSAT lessons in the class and academic achievements of students.

4. Students of class VII and their academic performance in science mathematics and social science.

Research Methodology

Since the present study comes under applied research, survey and observation methods were applied.

Sample Size

Sidhi district consists of five bocks. In all 50 schools (10 x 5 = 50) were covered under the EDUSAT project. Fifty teachers trained under the EDUSAT project and 500 students studying in these schools at upper primary level were included in the sample.

Tools

Interview Schedule For Teachers

The assessment of teachers' efficiency, professional development, awareness and attitude to EDUSAT lessons, and utilization of skills and competencies learned during

in-service training programmes were studied with the help of an Interview Schedule for Teachers (Tool-1). The schedule consisted of 15 main questions alongwith a number of sub questions related to the availability of physical and educational facilities in the school; availability of the equipments of ICT and downlink uplink facility for EDUSAT based telecast; their functioning, organisation of in-service training especially utilizing these equipments; teaching methodology (including teaching-learning process, activities and evaluation after the lessons telecast); problems and difficulty being faced; their remedies; professional aspirations; monitoring and supervision of their schools; co-operation from school authorities and department officials; and practical suggestions for quality education to achieve the goal of SSA.

Interview Schedule for Teacher Educators

This Schedule (Tool-2) was administered on 05 lecturers (DIET-Sidhi) working as incharge of the block and resource person for the training of ICT. The tool consisted of 10 questions alongiwth a number of sub questions related to organisation of in-service training programmes; their contents, process and strategies; academic monitoring and supervision of the schools; present status of ICT and EDUSAT facilities; their functioning, utilization in teaching and learning and safety; impact of these facilities on enrolment, attendance and achievement of students; impact of the facilities and trainings on professional growth, skill development, awareness, attitude and interest of the teachers; and suggestions for quality utilization of the EDUSAT project in the district to make teaching-learning process more interesting and intelligible.

School Observation Schedule

Observation is a process of seeing the phenomena and events in an on-going situation. It is used to evaluate the overt behaviour of individuals in controlled and uncontrolled situations. The availability of physical, educational and technological facilities in the school; their functional status; teaching-learning process and classroom activities; broadcast and telecast of radio and EDUSAT lessons respectively; content clarification and teacher-taught interaction; organisation of literary, cultural and games & sports activities; school discipline, teacher behaviour with fellow teachers and students, punctuality and accountability to accomplish assigned duty etc. were observed with the help of the School Observation Schedule (Tool-3).

Learning Achievement Test

Learning Achievement Test (Tool-4) was developed and administered on students of class VII studying in the schools under study. The tool consisted of 25 questions related to knowledge, understanding and application. The questions were objective, very short and short answer type and based on the books of science, mathematics and social science prescribed for the class. The test carried maximum marks of 100 and

was of two and a half hours duration. The same tool was administered on students of EDUSAT functional (N:25) and non-functional (N:25) schools to assess their learning achievement and utility of the project.

Analysis And Interpretation Of Data

Data collected with the help of different tools were analysed and interpreted. Tool wise analysis and interpretation are as follows:

Interview Schedule for Teachers

Analyzing the data collected with the help of the schedule it was found that Rajiv Gandhi Project on EDUSAT assisted Elementary Education (RGPEEE) was launched in the year 2005 by installing EDUSAT-sets in 698 schools at elementary level in Sidhi district of Madhya Pradesh state. All the teachers under study were trained to organise learning activities following instructions through EDUSAT lessons, but this training was reported as completely insufficient for successful utlization of the project. But all the teachers agreed that the proper use of ICT and EDUSAT assisted lessons are quite capable of capacity-building and professional development of the teachers. In spite of receiving training, most of the teachers (70%) were found not taking adequate interest in implementation of the project.

Interview Schedule For Teacher Educators

In all, 05 lecturers of DIET Sidhi who were in charge of the respective blocks to organise, monitor and supervise educational activities were interviewed. Analysing the data collected, it was found that DIET Sidhi did not have sufficient teaching staff to organise teacher training and other academic activities in the institute and district as well. They were not skilled enough to train the teachers to utilize the EDUSAT lessons technically. Theoretical knowledge and information have been provided to the teacher trainees but in case of any minor or major fault, they were found totally helpless. It was reported that during academic monitoring and supervision of the schools, quite a large number (56%) of schools were found with non-functioning EDUSAT sets. The state of non-functioning was either due to damage of some parts of the equipment or they were stolen. All the teachers responded that EDUSAT project is quite helpful in assisting teachers for their capacity building and implementation of their abilities for quality education. The need is to change their traditional approach of teaching and utilize educational technology for quality teaching and learning in the schools.

School Observation Schedule

Schools under study were observed by the investigators to have an overall view on academic activities being organised and utilisation of physical, educational, technological facilities and human resources. All the schools have physical and

educational facilities, but these facilities are not properly utilised. The objectives of the EDUSAT lessons were found suffering from negligence and inactive behaviour of the teachers. The project has been found successfully implemented only in 20 percent of the schools where teachers were active and accountable to the profession. At the same time, only 40 percent of the schools in the district listened to radio lessons for classes I and II.. Most of the teachers (65%) were not punctual, responsible and accountable to their profession.

Learning Achievement Test

Learning achievement of students (Class-VII) studying in functional and non-functional EDUSAT assisted schools were compared to assess the effectiveness of EDUSAT lessons telecast and teaching-learning activities imparted in the school. The average achievement of students of EDUSAT functional school was found higher with 56.06 as mean score than that of their counterparts in EDUSAT non-functional schools (45.7 as mean score). The calculated't' value i.e. 9.33 is higher than the table 't' value of 2.59, for df of 498 which shows highly significant difference between their achievements. This positive difference in average learning achievement of EDUSAT assisted schools was due to the professional efficiency, resourcefulness and responsible behaviour of the teachers to their profession. These teachers not only developed their professional competence but also increased the learning level of the students. The learning achievement of the students are presented in the following table :

Comparison of Learning Achievements of Students in EDUSAT Functional and Non-functional Schools

Type of school	N	Mean	SD	't' value	Inference
EDUSAT-functional	250	56.06	18.19	9.33	P < 0.01 significant
EDUSAT-non-functional	250	45.7	16.76		

Findings, Conclusion and Educational Implications

Major findings of the study are as follows:
- In all, 278 (40%) schools have been found functioning with EDUSAT sets out of 698 schools in which these sets were installed. In remaining 420(60%) schools some parts of the sets were either non functional due to technical problems or stolen due to lack of safety precautions as no post of watchman was sanctioned for night duty in the school.
- Training of only one day for handling and maintenance of the EDUSAT equipments and running the programme for teachers at DIET was insufficient and 80 percent of them thought it was totally impractical.
- Time table of the programme being telecast under the project was not available in the schools.

- Only 27 percent of the students have been found benefited by the programme. EDUSAT lessons have been successful in attracting interest and attention of sincere students.
- Most of the times about 50 percent of the teachers were found not present in the class while lesson was telecast. Moreover, the teachers present in the class seldom clarified the content and solved the problems raised by students.
- Due to lack of proper monitoring and supervision of schools by competent authorities, quality implementation of the project was found affected.
- Only 25 % of the teachers were found motivated, devoted and interested in the programme. These teachers demonstrated high level of cooperation. They found the programmes quite interesting, useful and closely related to the curriculum.
- There was significant difference between the learning achievements of students from EDUSAT functional schools (mean 56.06) and that of EDUSAT non-functional schools (mean 45.7). The positive difference may be due to the teacher-student active participation, concept clarification, and co-operative teaching and learning utilising EDUSAT lessons in the class.
- Students were observed waiting eagerly for the class and enjoying the lesson interestingly. The lessons were quite informative and intelligible in terms of content and presentation.
- Not only students but teachers (only 25 percent) also were found highly encouraged, motivated and co-operative to learn more and more utilising such ICT/EDUSAT –lessons. They proved themselves as active participators and keen learners interacting with each other.
- All the teachers have accepted the usefulness and applicability of ICT and EDUSAT for their own capacity – building and professional growth, as well as. skill development of children.
- The teachers (35%) who enjoyed the support, confidence and recognition of the head of the institution and job satisfaction were found more likely to live by their values and strive for inculcating these values in their students.
- 'Learning by doing' for ensuring learner participation was found quite successful in minimizing shyness and hesitancy of poor performing students and developed confidence for interaction and communication in them.
- In brief, the use of ICT and EDUSAT- lessons in classroom activities are remarkably successful in professional development of teachers and other personnel at elementary level. When utilised properly, it ensures the teaching-learning process interesting and joyful and enhances learner participation including the slow learners.

Conclusion

- Teacher education should respond to changes and developments that are happening around the world.
- EDUSAT is a boon for educational fraternity. It provides an opportunity to make teaching- learning process more interesting and intelligible through live interaction for imparting skill or building capacity.

- All pre-service and in-service teacher education programmes should include intensive training in the use of modern tools of information and communication technology including off line and on line electronic resources.
- It is quite possible to make teaching and learning process joyful, attractive and effective by proper implementation of the EDUSAT- lessons. The need is to implement the project honestly and effectively.

Educational Implications

The Yashpal committee observed that in the schools "a lot is taught, little is learnt or understood." Teachers are not to transmit knowledge only. They are supposed to develop skills, awaken curiosity, develop confidence, encourage intellectual rapport and promote moral and ethical values. They are to master both "What to teach" and "How to teach." Teacher education, therefore, should be a continuing process for capacity building and professional development of the teachers. Today, electronic media and educational technology have an important place in the education system. The need is to well equip the educational institutions like CIET, SIETs, IASEs, CTEs and DIETs with electronic media so that they could develop their infrastructure for improving the quality of teacher trainings and teaching-learning process in respective schools.

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EXPERIENCE WITH BLOGGING IN A TEACHER EDUCATION INSTITUTION

Nimrat Kd Khandpur[4]

Abstract

Various documents have stressed the need for using ICT to optimize teacher education. This paper reports blogging by the author to facilitate the learning of students of the B Ed and M Ed programmes. The purpose behind the creation of the blog was to provide students with links to various relevant sites as well as sharing of material by the author. The author describes in detail her experience with creating the blog and how it is evolving. Finally, reflections on how the strategy could have been improved are shared.

Introduction

The Internet is primarily viewed by individuals concerned with education as a means to facilitate learning. Although it has the potential to serve as the primary medium for imparting education, its use in the contemporary educational scenario is mostly exploratory.

The National Curriculum Framework (NCF) 2005 states that ICT "is an important tool for bridging social divides. ICT should be used in such a way that it becomes an opportunity equalizer by providing information, communication and computing resources in remote areas". It perceives ICT as having the potential for "changing the ethos of schools" as well as teacher education institutions. It stresses that teachers require first-hand experience of technology in order to develop an interest in it.

The Position Paper of the National Focus Group on Educational Technology states that "ICT and the Internet have emerged as dependable media of interaction" (NCERT 2006). Regarding teacher education, it states that "The Internet can be a sound investment for continuous on-demand teacher training and support, research and content repositories, value-added distance education, and online campuses aimed at increasing the access, equity and quality of teacher education".

The report of the National Knowledge Commission (NKC) recommends incorporation of ICT "more fully into teacher training programs, which in turn leads to ICT being used more freely in the classroom" (NKC 2008). It suggests that a forum for teachers to interact be developed for sharing learning and experiences.

With this in mind, it is axiomatic that teacher preparation must include use of information and communication technologies (ICT) (Khandpur and Husain) Not only knowledge of using ICT but knowledge of the pedagogical use of ICT are necessary. Teachers must be aware of resources that can be used to facilitate learning, be aware

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of innovations in the field and be able to learn and evolve as technology evolves. Above all, they must develop appropriate comfort levels while using ICT and be able to assess students' learning both in using ICT as well as in subject knowledge.

The National Council for Teacher Education (NCTE) in the National Curriculum Framework for Teacher Education 2006 recommends exploration of the "availability and use of computers and e-linking of the schools located in a cluster with teacher training institutions for changing the ethos of school and teacher training institutions" with "the availability of resources in the form of reference materials, access to internet resources and to resource persons" being "essential" (NCTE 2006). It states that there is a need to develop electronic linkages between national, state and district level resource institutions and teacher training institutions for promoting sharing of information and video conferencing. It also stresses that "Networking arrangements need to be created between IASEs/ CTEs/ DIETs with University Departments of Education on the one hand and Teacher Education Departments and other departments in Colleges of General Education on the other".

Experience with Blogging

Of the many means offered by ICT to share information are blogs. Blog is an abbreviated form of 'weblog', a chronological listing of entries put up on the World Wide Web for viewing by any individual who chooses to visit the page. A popular means of expressing views, the use of blogs has been reported for listing the work of students. In popular perception, blogs are forum for expressing individual views or maintaining a record of a discussion and so on. Interactivity is provided to users by the option for posting comments.

This paper reports the use of a blog to facilitate pre-service preparation of secondary school teachers as well as future teacher educators in a private university. The genesis for the blog developed by the author was the frequent request by students for links to topics pertaining to their course. The common complaint was that searching the Internet took a lot of time, which they found difficult to spare considering the intensive nature of the course. The blog was used to upload links to sites the teacher educator thought could assist the student teachers acquire the necessary information as well as perspectives on matters of interest. Care was taken to give links to at least three websites of interest unless the topic was highly specialized so that students obtained maximum possible information and got a chance to reflect on more than one perspective.

Another issue was the frequent photocopying of material they had to do, such as handouts for topics difficult to find in the library or material prepared by the teacher. The author pasted content from existing presentations or typed in the relevant matter for the convenience of the students. The added advantages of this strategy were, firstly that students who were not present the day the handout was given could conveniently access the material. Secondly, the teacher educator did not have to take

print outs of the material already in a MS Word or MS Powerpoint. The saving in terms of cost and time were well worth the effort.

The blog was created through the service provided by Blogger. (https://www.blogger.com/start) The steps for creating the blog were simple and extremely user friendly. The window for posting the content has a menu similar to that in MS Word (Figure 1). Content can be copied from word documents or PowerPoint presentations and pasted in the widow. Links to other sites can be uploaded as can photographs or diagrams, made in for instance in MS Paint.
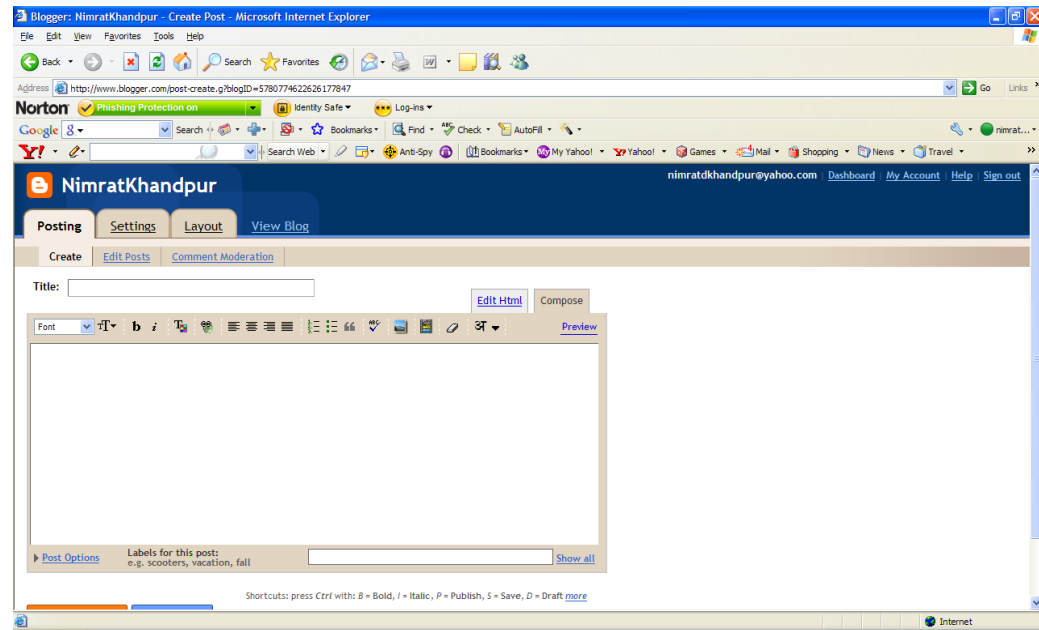

Figure 1: *A screen grab of the window for entering a post. Please note that the options offered include font and font size, bold and italic text as well as colour of text, formatting as well as removing formatting, links, block quotes, spellcheck, addition of an image or video. The option to type in Hindi is also available for Indian users.*

However, the option of uploading PowerPoint presentations is not available. The author chose to use the services provided by WiZiQ, where uploading PowerPoint presentations is simple and user-friendly (http://www.wiziq.com/) However, students reported that accessing these presentations took a long time. While keeping the option of posting PowerPoint presentations at WiZiQ open, the author chose to copy and paste the main points of the presentation for the ease and convenience of the students.

Another use the blog was put to was to upload instructions for projects, including theoretical inputs on the topic of the project. The author had found that students would frequently ask for instructions for projects as and when they chose to undertake them. The result was that the author had to explain the same content at least three to four times. The convenience of putting up content relating to the combined

queries of all the students instead of giving individual answers to the queries of each translated into more time for the author to look into other matters. Also, there was consistency in the inputs given to students.

Entries or 'posts' can be edited easily through the 'Dashboard' (Figures 2 and 3). Thus, content can be updated or deleted as desired.
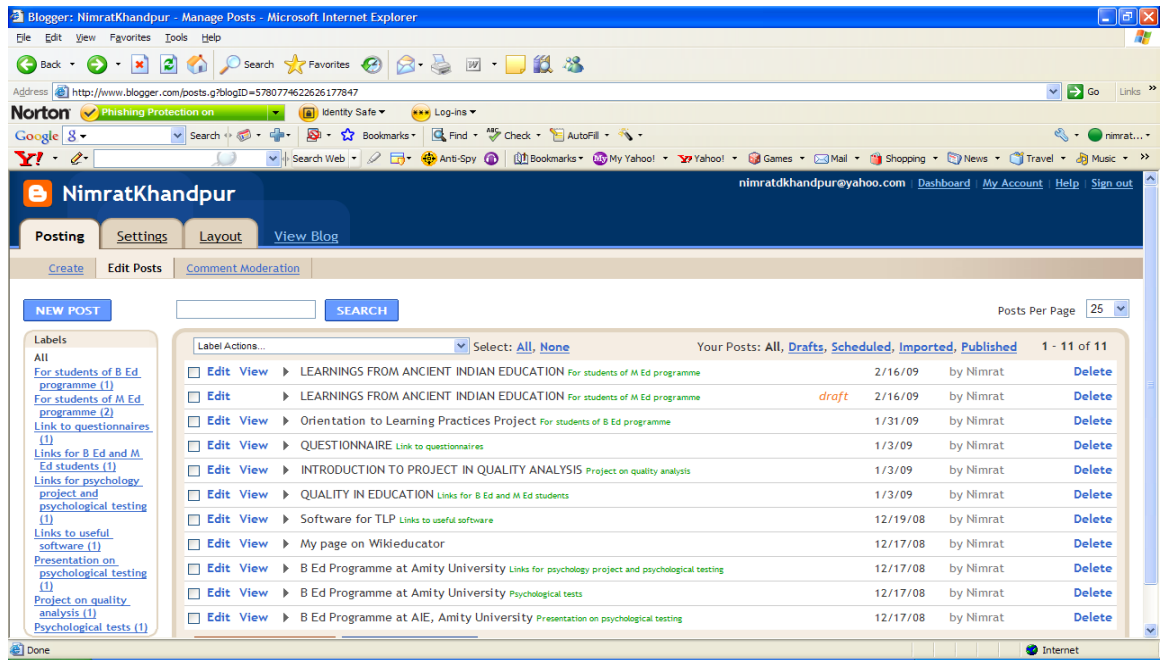

Figure 2: *A screen grab of the Dashboard showing listing of all the posts made by the author in chronological order with the option to delete, view or edit the posts.*
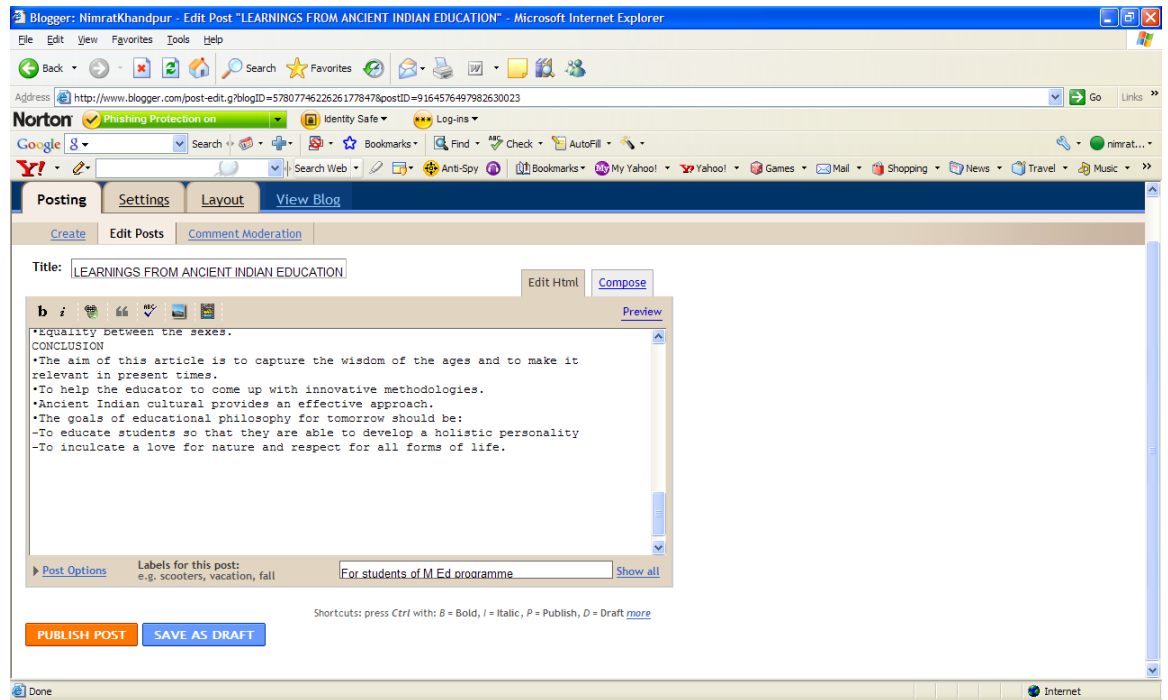
Figure 3: *A screen grab of the window for editing a post in the blog.*

Individuals who access the blog have the option to choose to 'follow' the blog, which means that they will be notified each time a change is made to the blog.

Another use the blog has been put to is for pasting material prepared by students of previous batches for assignments. A PowerPoint presentation has also been uploaded at WiZiQ. Not only is this recognition of their efforts but also motivational for present students.

Links to software that can be put to educational use have also been given, for instance, eXe authoring tool and stick figure animator. Interested students can download the software as well as the manual for independent learning.

To conclude, the posts concerned material for sharing with students, links to relevant websites and instructions for students. The blog was accessed by the majority of students, as evidenced by feedback from students; the majority also cited it in the bibliography of their projects.

Discussion

An earlier study on the students of the B Ed and M Ed programme for whom the blog was created had revealed that while about three-fourth were familiar with search engines, only about half were aware of the use of the Internet for networking. As far as blogs are concerned, only about a quarter showed familiarity with this technology. Keeping this in mind, the author should have given an orientation to using blogs to the students. This is especially of relevance when one considers the fact that although

the author had requested the students to post comments on the site, none of the students posted a comment. Only one chose to follow the blog, another indication that prior orientation would have optimized use of the blog.

Another feature that can be added is to use the services of facilities like Site Meter, StatCounters, Google Analytic, etc to keep track of the visitors to the site, the time they spent there, where they accessed the site from and so on (http://help.blogger.com/bin/answer.py?hl=en&answer=42078). This will yield a meaningful analysis of the use of the blog by students and help the author improve it.

An extension of this activity could be the formation of a group since students expressed not only a desire to upload links but also to upload their files. The author already has a page on Wikieducator, where documents can be uploaded or added. However, using Wikieducator means that a proper orientation has to be given to students. While this will help them gain an orientation to this tool, it needs entry level skills as well as time, the latter always being at a premium. The author plans to explore the use of groups for facilitating the enhanced interaction uploading.

Another option the author plans to explore now is to scan documents, such as notes, tables created by hand, etc to upload as images on the blog. It will be worthwhile to obtain feedback from students on the usefulness of this activity.

One issue of concern is whether this activity will delimit exploration by students. By giving students links to particular websites, one might be denying them the opportunity to explore on their own. The author plans to increase the number of links to offset this limitation. However, it must be kept in mind that no single site is comprehensive; by giving links, the author is saving the students from time wastage and frustration.

An interesting offshoot of the blog was for students of previous batches. Often, students call the author for help with their own teaching. They ask for more information about content taught in class. The author found it very convenient to give them the link to the blog from where they could access material. The feedback was satisfactory.

Conclusion

Blogging, if used innovatively, has the potential to be a dynamic reflection of the offline interaction between the teacher and the students, especially in the area of teacher preparation and teacher development. It especially has implications for preparation through distance education and continuing education of teachers. While it can be a means for facilitating access to material not part of standard references, it can also be a means for updations. Alternatively, it can serve as repository of links to resources for teaching-learning, for instance, links to good material for lessons, videos, etc. Above all, if use of blogging is made mandatory and teacher educators put up relevant material, it can serve as a means to enhancing the confidence of

students in using technology in a secure, non-threatening environment. This in turn will translate into use of technology in optimizing their own transaction with their students.

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WEB BASED INDUCTION PROGRAMME FOR ELEMENTARY TEACHER EDUCATORS

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&
Smt. Manjula R [6]

Abstract

After DPEP and SSA there has been a great increase in teacher development programmes. Comparatively, what is done for teacher educators has been very less. It is important that the implementers of all the SSA programmes are well educated about the programmes before hand. The theoretical understanding of these teacher educators, their attitudinal orientations go a long way in ensuring the success of SSA programmes. A few efforts were made in Karnataka in this regard. However, it was necessary to make teacher education programmes sustainable. Teacher educators can empower themselves provided right inputs are made available to them from time to time. It is from this angle that a web based induction programme was thought of. DSERT, Bangalore, in collaboration with RIE, Mysore developed a web page for this purpose. The training was initiated in July 2008 and the first batch is about to complete the course in a month' s time.

This paper describes in detail the objectives, processes and outcome of this programme. The web page created for this purpose is usable by any elementary teacher educator. It is hoped this programme will be of use to all partners in their educational endeavour.

Introduction

Professional development of teacher educators is as important as that of the teachers. Unless we have a good team of professionally driven teacher educators teacher education would not be effective at all. However, not many efforts are made to improve the professional capabilities of the teacher educators.   Ever since the establishment of DIETs, implementation of DPEP or SSA programmes, inservice teacher education has assumed a lot of significance. It was widely felt that teachers needed to be equipped with a sound theoretical as well as practical knowledge of classroom dynamics to ensure quality in education. This led to a sudden surge in the number of teacher education programmes organised every year.   Now under SSA, ideally it is expected that every teacher gets 20 days of inservice training in a year.

The teacher educators, on the other hand, did not receive as much attention as the teachers. The first focus being the teachers, the abilities of the teacher educators were by and large taken for granted. However, soon it was discovered that teacher educators are not able to function effectively unless they are updated regularly.

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This made DSERT, Karnataka think in terms of preparing an induction programme for DIET faculty in 1998. A package called ''Teacher Trainer' was prepared and a few programmes were also conducted. Subsequently, in 2005-06, the PPU, DSERT initiated a review and redesigning of the programme owing to certain changes in the functioning of the DIETs. But due to work pressure and other systemic reasons, the review work done really did not come into effect. On reflection, one can list a few reasons why these efforts did not really materialise as expected.

1. The pressure to organise teacher training programmes was so much that the DIET faculty really did not find time to take themselves away from DIET functions for a continuous period of a week or more.

2. The DIET faculty kept changing. Those who were trained got transferred to administrative posts and the new comers could not be trained immediately.

3. The needs of teacher educators changed from district to district as teacher trainings were decentralised and the DIETs could plan for their districts.

4. DIET faculties as such were not the RPs transacting with teachers directly. So even they did not have a very clear purpose for receiving inputs in this regard.

5. DIET faculty perceived their roles more as educational administrators rather than academicians. Without role clarification teacher education programmes would not make sense to them.

With all this, it became a practice in Karnataka to prepare teacher training packages and in a cascade model of training, the RPs would be prepared for conducting teacher training at the block level. This type of teacher education is highly contextual. In this model, teacher educators would not get empowered for decision making at their level.

It is at this juncture that DSERT approached RIE, Mysore for organising an induction programme for DIET faculty. The initial meetings held discussed at length about the inputs already planned. All relevant sections in the modules prepared earlier were retained. However, it was felt that the traditional ways of teacher education had not worked very well and there was a need to think of an entirely new approach.

RIE, Mysore came out with a proposal to organise a web based training of 6 months duration for DIET faculty in Karnataka. The use of internet has the following edge over the traditional method.

✓ The web can be accessed any time any where.
✓ The learners and facilitators could be working in their own work spots and still be in the training. Even if bringing them to a training venue is necessary for skill and competency development aspects of the programme, it should be of a short duration and should happen only to the extent necessary.

- ✓ A duration of 6 months would give enough time to every participant to adjust his/her timings and work out the assignments and other tasks.
- ✓ As there is no hurry to wind up everything in a week, the participants can put in a lot of thinking and creativity into their efforts.
- ✓ Facilitators could be engaged from all over Karnataka or if necessary even outside Karnataka to work in this programme as RPs.
- ✓ The web interaction would also have other by products such as developing the ability to use the computers and the internet, browsing for getting information etc.
- ✓ Since the internet is a great source of information, this programme, though technically restricted to 6 months, would have an on going effect on the participants. If they are given proper direction, they could specialise in an area or learn more than commonly expected.
- ✓ It would least disturb the person from his/her workplace.

The Aim of the Programme

- **To create an ICT platform to help the DIET faculty in shaping up oneself continuously as a resource person.**

The Objectives of the Programme

- *To understand DIET as an academic institution and the challenges before it.*

- *To develop an appreciation for the trainer's role in the DIET faculty.*

- *To locate and use ICT for enrichment and effective functioning as a DIET faculty.*

- *To enhance functional capabilities as a DIET faculty.*

Creating the Web Page

The space for web page is given by Wikieducator. The entire web page was developed by Dr V D Bhat. Two workshops were held to finalise the inputs under different areas. They were all keyed in and uploaded to the page. The other reference material, audio and video material were also linked. The organisation of the material in terms of its availability could be understood as follows.

1. Material directly available in the web page
2. File which are loaded and available only if clicked.
3. Resources available in the internet to which links are established.

Facilitation Processes

Facilitation of interaction as envisaged by the programme is represented in the following diagram.

FACILITATIONS AND INTERACTIONS IN THE INDUCTION PROGRAMME
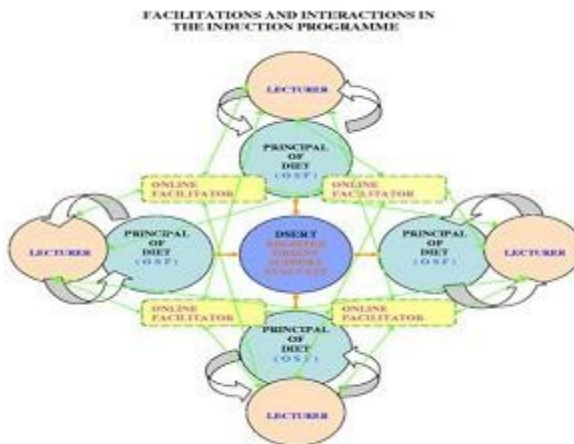
DSERT, Bengaluru is the nodal agency for organising the programme in collaboration with RIE, Mysore. There are two types of facilitators.

1. On line facilitators – who are available any time on the internet. The interaction is carried on through emails.
2. On site facilitators – the principals of DIETs who over see the progress of the participants from his/her DIET and provide all facilities to work on the assignments given.

The Content

The training package looks at the functions and responsibilities of a DIET faculty in relation to the state of primary education. Thus all the areas that make a DIET faculty a trainer and a researcher have been addressed. The content could be classified into five broad areas.

Areas Covered In the Induction Package

1. DIET Roles and Functions
2. Trainer Skills
3. Research and Reflective practices
4. e-media
5. Planning
6. General Topics for Awareness

How Does It Work?

1. The staff member of DIET is required to register online as well as by post by filling the REGISTRATION FORMAT enclosed.
2. The DSERT would organise an orientation programme to the participants on the training package, procedures to be followed, etc.
3. Upon receiving confirmation, the faculty is required to work online with the material, preferably area by area, and complete the activities/ tasks as per instructions provided.
4. Each section has a suggested time for completion. Even though you are free to proceed at your own pace, the time frame may be kept in mind for maintaining efficiency and for enabling face-to-face programme to be scheduled.
5. Reading material, supplementary material in videocassettes and transparencies for classroom transaction have been prepared and incorporated in the training package.
6. Training is conducted both online and face-to-face. However, teleconferencing could be incorporated for review of progress and redressing difficulties faced by the trainees in completing the online component.
7. The respective DIET Principals have to facilitate the completion of online component by providing Internet facilities and administrative clearance for undertaking various activities envisaged in the package.
8. The assignments and activities completed have to be communicated online, through e-mail to the address given, with a copy to the coordinator at the DSERT.

Some Features

The programme inputs of this web based induction programme consist of
1. Primary texts, pdf file attachments and AV clippings developed by the online facilitators
2. Pages from relevent internet sites under different sections
3. Video clippings on different topics and for different training objectives
4. All assignments are also provided under 'Self Check and Evaluation' on the main page
5. The Book Shelf has a collection of relevent material and also consists of four activities to be accomplished by the participants during the training
6. Web Resources provides with connections to internet sites which could help a particpant as a DIET faculty
7. The participants can get to know about the online facilitators and their e-mail ID by opening *online facilitators* on main page
8. At the end of every page is a **navigation help** that allows participants to go to any section of the package without having to go to the main page. They would need this help when they want to parallelly refer to more than one section of the package.

Time Allocation

The rigidity of timings is relaxed, prioritizing the process part of the training. However, suggestions are made for completing an activity in a time frame. This has been done keeping in mind the fact that the faculty of DIET is also engaged in certain routine activities of the institute while receiving the training inputs.

Teleconferences

The programme consists of three teleconferences to be held in within the course duration to help the participants seek clarifications and for exchange of feedback between participants, the facilitators and the DSERT. Each teleconference would specifically focus on two areas. Hence, the first teleconference would be centered around first and second areas, the second teleconference on third and fourth areas and the third teleconference on fifth and sixth areas respectively.

The first and final interacitons are face to face. The first interaction is to initiate the participants into the use of web resources and other procedures becasue every one is new to this approach. The final interaction is to take stock of the situation, wind up the discussions picked up earlier during the course. After a post test, certificates would be issued to the participants.

The Other Users

1. The training package, though initially being used by DSERT, in future it can also be used by any institute such as, SCERTs of other states, RIEM, ATI Mysore, IASEs and others who propose to train the DIET faculty.
2. The package aims to cover several areas of training such as e-media and trainer skills, which are general in nature and therefore can be adapted by any training institute.
3. The training package, though tested, welcomes enrichment in course of time. One of the ways of attaining this is evaluating the course each time it is run.

The Present Status

This programme was launched in Karnataka in the month of June, 2008. By December 2008 the first batch was expected to complete the course. However, due to non availability of studio for organising teleconferences, busy schedules of facilitators and engagement of DIET faculty in a number of department programmes, only two teleconferences could be held. The last one and the face to face interaction is due to be held in March, 2009. The first batch had 54 participants enrolled from 27 DIETS.

The Outcome

The direct outcome of the first programme is yet to be assessed because the programme has not come to an end yet. However, there are many other issues that have been observed.

1. The participants have grown comfortable using the email for communication. All participants have learnt to prepare their assignments in the computer and send the same to the on line facilitators throug email.
2. The participants have learnt to browse the web resources to collect information on various issues.
3. They have learnt to use word processors, spread sheets and power point presentation. They have also practised using the LCD projectors and whenever they had problems, they have referred to the literature given in the website on the use of LCD projectors.
4. Some of them have learnt uploading literature and editing the webpage.

ENHANCING MENTAL ACTIVITIES THROUGH ABACUS:
A LOW COST EDUCATIONAL TOOL

Dr. Kiran Lata Dangwal[7]

Abstract

To enhance mental activities of children, it is necessary to activate human brain. There are two parts of human brain, the right brain and the left-brain. The left-brain called analog brain and the right brain is called digital brain. Abacus can be used as an effective instrument in activating the brain. Activating the brain means developing the muscles of brain, mental activities and lifetime skills.

Abacus user students manipulate abacus beads in their mind to carry out a calculation, which is very effective method in training the right brain or the analog brain. By repetitive practice, abacus gets engraved in the mind in advance and afterward children do calculation with the help of virtual abacus in the mind. Abacus and imaginary abacus involve the cultivation of intelligence for both left and right hemisphere of the brain. Abacus simplifies and reduces student's burdens, acquaints students easily with knowledge, improves student's, interest and mental activities.

Abacus not only bears calculation functions but also has important functions of quality education and intelligence cultivation, turning out to be a useful low cost educational tool and enhance children's mental activities. Abacus training increases speed, accuracy, learning ability, writing skills, endurance, logic and boosts up memory power.

INTRODUCTION

"Mind is the great lever of all things; human thought is the process by which human ends are ultimately answered."

- Daniel Webster

Above said lines by Daniel Webster appropriately mark the importance of human brain. In the present technology era stress is on speed and accuracy on account of competition. The academicians and parents always try to make their children do well in academic activities. So there is urgent need to enhance mental activities of the child in the formative years which would help in habituating the mind to work diligently from early years. Children in the age level four to twelve works and compete together. Allowing them to work and compete together helps children to face competition without any fear and helps to work under time related pressures. Learning in the early years is pronounced and is easy to master. These years are an

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important time of transition and growth in students' mental activities. To enhance mental activities of children, it is necessary to activate human brain.

According to research, mental abilities in children must be developed by the age of 12. Mental growth is most rapid before the age of twelve. The degree of mental development achieved by a child during this time has a great influence over his/her future.

The development of the brain is far greater than the physical growth from birth to the age of eighteen. During this period, a child consistently become brighter if sufficient simulation has been given to his/her brain.

Human Brain

The human brain seems to consist largely of regular structures whose neurons are trimmed away as skills are learned, like featureless marble blocks chiseled into individual sculptures.

Human brain potentialities are unlimited. Generally human brain growth occurs in the period of four to fourteen years of age. There are two parts of human brain, the right brain and the left-brain. The function of both brains varies from each other. The left-brain controls reading, writing, calculation and logical thinking that is why it is called analog brain. The right brain is called digital brain as it controls three-dimensional sense, creativity and artistic senses. Jerre Levy (1969) investigated the functions of the two hemispheres, finding that the left hemisphere is superior in analytical function and language. The right hemisphere was found to be superior in visual and spatial skills, and tends to function more holistically.

Robert Ornstein and Roger Sperry (1960) discovered that the brain is divided into two halves or hemispheres and different kinds of mental functioning take place in each. Thus, in most people the left hemisphere operates sequentially and deals largely with 'academic' activities, such as reading, arithmetic and logic. By contrast, the right hemisphere operates holistically and deals more with 'artistic' activities, such as art, music, colour and creativity.

Creativity is composed of creative thinking and creative imagination. Creative thinking is the organic combination of emanative thinking and collective thinking. Creative imagination plays an important role in creative activities. The right brain plays a decisive role in creativity. Therefore, developing children's creativity must start from developing children's right brains. Mental arithmetic by image of abacus develops the right brain. Right brain can be activated by the use of ABACUS. While using abacus children are encouraged to drive beads with two hands. Repetitive actions of this kind motivate fingers of the left hand and develop one's right brain functions.

For doing mental arithmetic image of abacus is imagined in the mind by the student. With development of proficiency, what move in mind become fixed in mind, and even pictures at last, instead of beads. The faster the mental arithmetic becomes, the more

drastically pictures change in mind. In this perspective, abacus and mental arithmetic is a process of picture changing in imagination of the right -brain, thus develops its functions of imagination and image thinking.

Humans have the highly developed cerebral neocortex that can create nerve cells. After some years of birth, suitable stimuli start to activate the nerve cells in the neocortex. This is why children grow up well in many aspects if they receive appropriate stimuli that develop the nerve cells in the neocortex. Nerve cells of brain can be activated by providing stimuli. Moving fingers and talking aloud while abacus training leads to activation by providing appropriate stimuli in the large part of sensory motor domains in the cerebral neo-cortex. Brain researches make it clear that children learn best when more than one sense modality is used when they learn (Winters, 1994). As a result, a multi-sensory learning environment offers the best environment for learning to take place. Abacus is one of the effective tools which provide multi-sensory learning environment to the learner.

In 1981, Nobel Prize winner RW Sperry found through the research of "Split-brain man", that the brain of human beings can be divided into two hemispheres, the left brain controls the right-side movement: logic thinking, language, concept mental arithmetic, time perception and series information etc; and the right brain controls the left-side movement: image thinking, music, dancing, space perception and parallel information etc.

Hatida Takesi in Japan Osaka Educational University in 1984 found through experimental research that abacus/ mental arithmetic is the function of right brain and learned that abacus/mental arithmetic can develop the right brain. If both the left and right brains are developed, children will naturally become wise.

Mr. Jiang Zhifeng (2000) conducted experimental research about the functions of the brain with scientific instruments on 43 students in Grade 3 of which 21 children were with 3-year abacus/mental arithmetic training (the training team) and 22 children were without abacus/mental training (comparison team) .The experimental result showed:(1) the students in the training team developed their functions of brain well and their brain physiological functions that are required by the development of creation ability were better than those in the comparison team; (2) the students in the training team had advantages in both focusing their attention and choosing with flexibility; (3) the students in the training team had broad space of reverse ordinal number and had strong capacity in extracting information; (4) the students in the training team were obviously quicker at finishing the digit -searching task than those in the comparison team. The experiment indicates that abacus/mental arithmetic is sort of interior intellectual activity and its transferred effect is not in the outside but in the central processing. The research shows that the abacus/mental arithmetic enables children to transfer largely during the center nerve cognition activity and enable them to improve their intellectual levels and perception ability, especially with the age group 3 -12.

The left -brain and the right -brain are in close connection and coordination in each phase of creation process. The left-brain plays a decisive role in abilities of language, calculation, logical thinking and analysis, while the right brain plays a vital role in creation process as a nerve center of sensibility, imagination, sense of figure, space, and image thinking.

Abacus: A Low Cost Educational Tool

The early human beings used different things for counting. Later on when they became more civilized, they started using abacus, which was the first calculating machine, developed by the Chinese 2000 years ago. Abacus is still being used in many countries and even in India for primary education. Abacus is a Latin word but its origin is in Greek words, abax or abakon which means table or tablet. The abacus is made of hard wood. The frame of the abacus has a series of vertical rods. A horizontal beam separates the frame into two sections, called the upper deck and lower deck. Upper deck has one bead and lower deck has four beads. Each bead in the upper deck has a value of five and each bead in the lower deck has a value of one. The beads slide freely on the abacus. The abacus itself does not calculate, it is a simple device that help learner to calculate by remembering what has been counted. It does not require the use of pen and paper.

Enhancing Mental Activities through Abacus

Abacus is a low cost calculation technology based on the "bead". Abacus includes two aspects. In a hardware form abacus is used as an educational and calculation tool and as a software form it is used in calculation method. Abacus can be used as an effective instrument in activating the brain. Activating the brain means developing the muscles of brain and lifetime skills. While using abacus, children put their thumb, index finger and the middle fingers for counting. Using fingers in such a way on abacus is a very good technique in influencing the right brain to be activated through which speed, accuracy and concentration can be achieved in every field of learning.

Abacus learning is useful in understanding the numbers, which make children fond of mathematics and also increase concentration level, memory power, creativity, reasoning, imagination, organizational skill. **Hartley Howe** said "**…** the Abacus is a milestone in the use of mathematics to master the Physical world..." – (Encyclopedia Vol.1 Edition: 1999)

Abacus user students manipulate abacus beads in their mind to carry out a calculation, which is a very effective method in training the right brain or the analog brain. Children who do not use abacus do calculation by putting mathematical notions into words in their mind using inner voice while abacus users visualize an image of abacus in their mind. They do not replace the image into words. Abacus user uses both hands to move beads and actions of their hands are well coordinated which promote the development of the whole brain because left hand stimulate right brain activity like creativity and imagination and right hand help in the development of calculating and

logical function of the left brain. In this way the function of the whole brain is developed with the use of abacus because the left and right brain transmit messages to each other. Abacus user children, become quick witted and have developed intelligence. By repetitive practice of working on the abacus, it gets engraved in the mind in advance and afterward children do calculation with the help of virtual abacus in the mind. **Caine & Caine (1997)** also supported that "the brain is nourished by novelty and repetition". Counting is an exercise for the brain and nurtures movement, which increases the love and ability to learn. Children who use an abacus can do calculations faster than the children who use calculator or computer. Abacus and imaginary abacus involve the cultivation of intelligence for both left and right hemisphere of the brain. Driving beads is beneficial to foster students' ability of specification of abstract problems. Abacus simplifies and reduces students' burden, acquaints students easily with knowledge, improves students', interest and mental activities.

Abacus helps students to observe things by essence through phenomenon instead of superficial complication or simplicity, nobleness or cheapness, and to foster scientific spirits for exploration and creation. Abacus is good for the low intelligent, the illiterate and the blind because it reduces a series of brain burdens in abstract numerals study and makes study easy and interesting.

Abacus And Mental Arithmetic

Childhood period, is a transitional period to develop concrete and abstract thinking and these thinking are promoted favorably by mental arithmetic with the use of abacus. *Training of mental arithmetic, through abacus, is helpful not only in speedy calculation but also in figure and logic. Therefore, the outstanding advantage of abacus and mental arithmetic is to promote figure and memory ability. Learning mental arithmetic helps in tapping intelligence, enhancing ideation smartness and making accurate calculation without using computer.*

Abacus and Computer

In the information and communication technology era day by day the world is becoming gradually small alongwith machinery civilization. The era that used abacus for calculation has been replaced by computer.

Computer with amazingly quick and shortcut characters does not replace the studies of calculation method and skill. The mathematics is a subject difficult to study because it is of highly abstract character compared to other subjects. ***Children, who use computer too much, deteriorate the ability of ideation in them.***

With the development of informatics and electronic gadgets, people thought that abacus should be put in show cases only. But studies have shown that use of abacus stimulate brain functions. It has a functional role in effectively tapping the children's intelligence and human brainpower.

Abacus, mental arithmetic and computer studies are supplementary to each other. Abacus has similarity with computer in terms of calculation principle, mechanism and model. Both start calculation from multi digit number. Studying abacus and mental arithmetic doesn't mean that one should not learn computer, in fact abacus help in learning and using computer better.

Abacus is quicker than computer in calculation of addition – subtraction and one digit multiplication.

*Abacus and mental arithmetic is not only a calculation method, but also a good way of thinking, **and close to the human brainpower at most, but on the other hand of gene mechanism, abacus is near to the computer also (for example, written calculation, ruler calculation, table calculation and etc.). Abacus is accustomed to thinking by way of mental arithmetic; therefore it has more advantage in using computer more creatively.** Therefore, mental arithmetic is a good way for both developing human brainpower and mastering and controlling the computer functions.*

The computer and abacus share the same principle, uniform calculation mode, similar system, corresponding language, equivalent calculation program, and similar methods and skills. The only difference is that the former is driven by electronic technique while the latter is manually driven. Therefore, abacus is nothing but a suitable instrument to foster human intelligence in line with modern technology demand. Abacus is a perceivable, flexible and simple teaching tool to teach computer principles and calculation methods manually.

Abacus not only bears calculation functions but also has important functions of quality education and intelligence cultivation, turning out to be a useful low cost educational tool and enhance children's mental activities. It can both foster children's creative thinking and practical abilities through hand use and brain use, and foster their excellent mental qualities such as attention, visual awareness, and memory, fortitude, confidence and competition sense, to effectively develop their intelligence.

In the early history of abacus and mental arithmetic, people calculated with abacus, and they had to drive beads while watching or listening. The fabric of abacus was simple enough to everyone. Now importance is given to multi brain power rather than calculation. The computer applies electronic equipments but abacus is based on brain and hand. Abacus shares the mechanical operations and interactive application of the same storage unit with the computer. Abacus is the ready-made educational tool to learn computer mathematical principles and arithmetic foundation.

In the abacus and mental arithmetic classroom, children understand the importance of safekeeping abacus and respecting private property of others. While testing each other, they learn how to respect others and express in a proper way. When calculating with concentration, they know how to work effectively. After grasping methods, they have to review consciously which is good to their memory and thinking.

Educational Implications

Abacus is an effective tool to calculate simple mathematical problems rapidly and accurately. In the beginning children do calculation with the help of abacus, after some months of training, children acquire the ability to do mental calculation utilizing the abacus image in their mind, which allows quick calculation without actually using the abacus.

Use of abacus training enhances listening skills, thinking power, concentration, imagination, clarity, photographic memory and all-round academic proficiency, apart from speed and accuracy in mental arithmetic. So, if children are trained to use abacus, it will enhance their mental activities.

Such training will build a strong foundation in primary mathematics which will indirectly help to perform better in other subjects too. By using abacus as an educational tool, mathematics may become easy to learn. Abacus training improves the calculation ability of a student in a very short period and enhances numerical ability. It helps in solving general mathematical problems taught at elementary level, including the four fundamental arithmetic calculations and word problems. Abacus training increases speed, accuracy, learning ability, writing skills, endurance, logic and boosts up memory power.

It promotes concentration, comprehension imagination, vision, observation capabilities, photographic memory, self-confidence and self-reliance.

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A STUDY OF IMPACT AND EFFECTIVENESS OF INNOVATIVE PROGRAMMES UNDER SSA FOR CHILDREN WITH SPECIAL NEEDS

Dr. Arvind Sharma [8]

Abstract

Sarva Shiksha Abhiyan is a flagship programme of government of India for the promotion of universalization of elementary education. The SSA's understanding of "inclusive" is depicted as a multi-option model of inclusion which includes, depending on the needs of the children, mainstreaming in regular schools, or provision of home based education. Several states are undertaking successful quality improvement initiatives. The Learning Guarantee Programme in Maharashtra has enabled more than eight lakh children to get remedial support for satisfactory learning; other examples are language improvement programme in Andhra Pradesh and Integrated learning improvement in West Bengal. Different states have instituted systems for large scale independent assessment of CWSN and are using the result for systemic improvement like focused teacher training in specific disability area, developing remedial teaching programmes etc. This paper analyses the different innovational programmes run by central and states government, NGOs,etc under SSA for education of CWSN.

Introduction

The key objective of SSA is Universalization of Elementary Education (UEE). Three important aspects of UEE are access, enrolment and retention of all children in 6-14 years of age. This goal of UEE, has further been facilitated by the Constitutional (86th amendment) Act, making free and compulsory elementary education a Fundamental right, for all the children in the age group of 6-14 years. This Amendment has given new thrust to the education of children with special needs (CWSN), as without their inclusion, the objective of UEE cannot be achieved. In fact inclusion of one of the groups, which is extremely crucial for UEE, is perhaps that of CWSN. Hence, education of CWSN is an important component of SSA.

SSA ensures that every child with special needs, irrespective of the kind, category and degree of disability, is provided meaningful and quality education. Hence, SSA has adopted a 'zero rejection policy', so that no child is left out of the education system. The major thrust of SSA is on inclusion or mainstreaming CWSN into the fabric of normal elementary schooling. Experiences of programmes like DPEP and various research findings have shown that inclusion is best determined by the individual needs of the child. Most children with special needs can be enrolled and retained in regular schools if adequate resource support is provided to them, whereas there are others who might have to be provided some kind of pre-integration programmes before they can be mainstreamed in a classroom. There might also be

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some children with severe disabilities who need educational programme and intensive specialized support completely beyond the purview and scope of a formal school in the current situation.

Thus, SSA has adopted a more expansive and a broad-based understanding of the concept of inclusion, wherein a multi-option model of educating CWSN is being implemented. The dual objective of embracing this model is to bring more CWSN under the umbrella of SSA and to provide to CWSN appropriate need based skills, be it vocational, functional literacy or simply activities of daily living.

Objectives

The objectives of the study were as follows:
- To assess the state of education for children with special needs under SSA in the country in terms of policies, resources and practices.
- To provide suggestions to strengthen the capacity of the government and other partners in the country to bring about policy reforms and promote programmes that support education of CWSN.

Methodology

The study was based on information available from officials and professionals working for the education of children with special needs under SSA. The school practices were documented after discussions with teachers, parents, children with disabilities and their peer group. The concerns of NGOs, bureaucrats and professionals from apex institutions for teacher training were accounted for by carrying out interviews. Based on documentation, field observation and data analyses, this study identifies positive initiatives taken up by the government and NGOs, and suggests further measures that need to be taken to achieve the goal of UEE for children with disabilities under SSA.

A Review of Existing Innovative Programmes under SSA for CWSN

The implementation of this multi-option model of inclusion in SSA has been made possible due to the flexibility offered to each state by the programme. Although most SSA states have identified and enrolled CWSN in schools, they differ in the approaches and strategies adopted to achieve the ultimate objective of inclusion. States like Andhra Pradesh, Bihar, Madhya Pradesh, Punjab, Rajasthan and Uttar Pradesh have conducted residential bridge course of CWSN with the main objective of preparing CWSN for schools, thereby ensuring better quality inclusion for them. While Rajasthan is conducting these bridge courses entirely through NGOs, UP is conducting them through resource teachers especially recruited by the District SSA Societies for the purpose. Andhra Pradesh has adopted a mixed model, with some districts conducting these courses through NGOs and other through the District SSA societies. Besides this, 11 states are also covering CWSN through the EGS. So far in SSA, 112033 CWSN are being covered through AIE/EGS in 17 states. Another

practice adopted by SSA states (21 states so far) is that of the home-based education for children with severe disabilities imparting to them basic living skills. Again states have adopted different ways to provide home-based support to CWSN. States like Himachal Pradesh and Uttrakhand are using NGOs for this purpose, whereas states like Haryana and Kerala have appointed resource teachers who visit the homes of CWSN to provide them basic functional skills. A notable feature of this programme has been using special schools as resource centers to provide short-time or part-time help to individual children with special needs and their parents. Parental counseling and vocational training are two important aspects of the entire home based instruction programme. Through home-based education, SSA has promoted sustainable school-community linkage by actively involving parents in the educational process of their CWSN.

There are 6678 resource teachers appointed in 22 states and 687 NGOs involved in the IE programme in 28 states. An important and unique facet of this involvement is the range of activities that the NGOs have undertaken in states where IE programme is in implementation. These activities vary from planning for inclusion as in West Bengal or the implementation and monitoring of IE in Tamil Nadu. Other States have engaged NGOs for designing and initiating innovative programmes. These include theme based camps in Orissa and development of Low-cost / No cost simulation park for social inclusion of CWSN in every BRC of Tamil Nadu, to training key resource person from the families of CWSN in West Bengal and preparation of adopted TLM for CWSN in Karnataka.

Two additional forms of resource support, complimentary to each other, being provided to CWSN are through assistive devices and barrier free access. Both of these aim enhancements of the functional capacity/ mobility of CWSN to promote their easy access to the schools. Under SSA, 7.11 Lakh CWSN 76.44% of the CWSN requiring aids and appliances have been provided assistive devices through various modes. Some States like Haryana, Himachal Pradesh and Uttar Pradesh have converged with District Disability Rehabilitation Centers, Local Red Cross, Composite Regional Centers, NGOs etc. and some States like Kerala and Andhra Pradesh have made arrangements to provide the necessary equipments to CWSN through the state Government supported organization like A.P. Viklaangula Corporative Corporation (APVCC) and Kerala State Electronic Development Corporation (KELTRON).

The states have shown a variety of responses to the multi-option model. States like Andhra Pradesh and Uttar Pradesh have focused on innovative residential bridge courses for CWSN in order to prepare them for school. Either NGOs or specially recruited teachers, or both, run these courses. A number of states address CWSN through the EGS. As of 2006, 61,161 CWSN are being covered through AIE/EGS in 15 states and 74,170 are under home based education in 15 states. Here, children with severe disability are prepared for school or given life skills training, through NGOs(as in Himachal Pradesh and Uttaranchal), or resource teachers (as in Kerala). Some states like Tamil Nadu and Haryana have special or model schools and have

innovated extensively through ideas like play parks at BRCs. Other support includes provision of assistive devices and barrier free access. Many states (Himachal Pradesh, Kerala, A.P. and Gujarat, for example) have converged their activities with the District Disability Rehabilitation Centers, the Red Cross, and government corporations. The ALIMCO(Artificial Limb Manufacturing Corporation of India), which functions under the Ministry of social Justice and Empowerment, meets 60% of the cost of the assistive devices, leaving only 40% for the states to bear.

SSA provides up to Rs. 1200/- per child for the inclusion of disabled children per year. District plan for children with special need is formulated within the Rs. 1200/- per child norm. In Andhra Pradesh, residential bridge courses camps for special educational needs children are running since 2004. Here classroom practice begins with a 15-20 days schools readiness program. The children are divided into small groups based on the extent of their disability. The special educational instructor prepares individualized educational plans for all the children. A special area for attention is teaching the children how to associate with their peer group. Speech therapy and vocational training are also part of the curriculum. Co-curriculum and extra curricular activities include dancing, drawing, sports and games. Children's language improvement programme and computer aided learning (CAL) programmes are also running in this state. CAL was started in mid 2004 in collaboration with Azim Premji foundation. In 2006-07, CAL covered about 3.5 lakh children including sixty five thousand CWSN in 23 districts through 1702 centers (The Hindu, Jan, 2008).

Assam runs innovative programmes like Bidya jyoti, learning assurance programme and Nava Padakshepa schools that keep track of childrens' learning process in a systematic manner and extend remedial support to slow learners. Similarly Gujarat has undertaken a series of studies on learning achievement of children in collaboration with Bhavnagar University and Saurashtra University. Other than identifying the learning disabled children, the state has been attempting to extend remedial support to teachers and learners on a continuous mode for enhancing quality of classroom transactions.

Apart from the usual attention to training parents and establishing facilities, the Karnataka government has appointed resource persons and opened resource centers at the block level to handle children with special needs. These teachers are regular teachers who have been given special training. They are trained in conducting surveys of children, functional assessment, handling medical camps and providing training to teachers and parents. They monitor the progress of the children and acts as a bridge between the schools, the parents and the CWSN.

Since 2001, OPEPA (Orissa primary education programme of action) has been conducting door to door surveys with the help of Anganwari workers for the identification of children with special needs, followed by parental counseling. The outcome is that so for 133,748 children have been identified, out of which 117,528 have been enrolled in different schools as of 2005-06. The OPEPA set up 27

computerized Braille printers in 27 special schools to print text books and supplementary materials in Braille. Tactile device systems have also been provided to special schools on an experimental basis to enable the visually impaired children to read through computers, without the help of teachers.

Inclusive education is being implemented in Tamil Nadu in collaboration with reputed NGOs experienced in educating children with special needs. Representatives of these NGOs constitute a state resource group which supports the SSA. The NGOs have innovated in areas like mobilizing CWSN and their parents through educating parents about the rights of the child, training regular school teachers, home based training for the severely disabled, and providing sustained academic support to these children. A number of small scale innovations have been generated in classroom practices; seating arrangement for CWSN; methods of teaching by the regular teachers and by the special educators, TLM for a variety of disabilities, utilizing services of peer group children, and group activities in the classrooms or on play grounds. Two significant large scale innovations of the SSA have been setting up an inclusive education for disabled (IED) resource room in each block resource centre (BRC), and the 'Inclusive Play-park'.

The IED resource rooms in the BRCs have been exclusively designed for CWSN. The children receive regular therapy to improve their muscular and kinesthetic skills. Other usual interventions (like medical check up, and audio-disability testing) are integrated with these resource rooms. There are 412 resource rooms in Tamil Nadu and during 2005-06 more than 10,400 children received training at the IED resource room. Such resource room has had a major impact in training the identified children and mainstreaming them into regular schools. The rooms have the equipment needed for all types of therapy. Thus local CWSN who need special care in physiotherapy, speech therapy, sensory approach exercise, simulation exercise, use the rooms. Similarly, Inclusive play-park has focused on the physically active child. These parks provide children with disabilities the opportunity to interact and play with non-disabled children. The inclusive park activities have shown to develop in the children muscular and kinesthetic abilities in addition to psycho-social adaptability.

These practices and innovations under the SSA are no doubt leading to a gradual increased identification of CWSN from 14.59 lakh in 2003-04 to 30.38 lakh in 2006-07. Similarly, the enrollment of CWSN in 2006-07 has gone up to 19.97 lakh as compared to 11.71 lakh in 2003-04. More CWSN are likely to be identified and enrolled this year in schools through various interventions and strategies. The current coverage of CWSN is 21.86 lakh (71.99%). Besides increasing the physical coverage; the expenditure on inclusive education in SSA has also shown an upward trend. From a mere 26% expenditure in 2003-04, the states have shown an overall expenditure of 65.50% on CWSN inclusion related activities in 2007-08.

The focus now is on reaching out to those still to be covered, and more importantly, ensuring that the CWSN already enrolled continue to receive support. This is crucial

if CWSN are to complete the elementary cycle. More attention to classroom practices and teaching methods for CWSN is also called for.

Key Observations

Based on analysis of the different innovative programmes run by different governmental and non governmental organizations, the following key observations are made:

❖ Central and state governments have taken a number of initiatives to improve the enrolment, retention and achievement of CWSN. There is a need to establish interlinks and collaborations among various organizations to prevent overlapping, duplication and contradictions in programme implementation.

❖ Budgetary allocations are not enough to make significant impacts in the field of education. Unless state governments allocate funds for inclusive education at different levels, it will be difficult to achieve the goal of UEE because CWSN will continue to remain outside the reach of primary education.

❖ Most services for children with disabilities are concentrated in big cities or close to district headquarters. The majority of children with disabilities who live in rural areas do not benefit from these services.

❖ Community involvement and partnerships between government agencies and NGOs have been instrumental in promoting inclusive education.

❖ Training for sensitization towards disability and inclusion issues, and how to converge efforts for effective implementation of programmes, are important concerns.

❖ Families do not have enough information about their child's particular disability, its effects and its impact on their child's capacity. This often leads to hopelessness. Early identification and intervention initiatives sensitize parents and community members about the education of CWSN.

❖ Different disabilities require different supports. The number of skilled and trained personnel for supporting inclusive practices is not adequate to meet the needs of different types of disability.

❖ The curriculum lacks the required flexibility to cater to the needs of children with disabilities. There are limited development appropriate teaching-learning materials for children with disabilities. The teaching-learning process addresses the individual learning needs of children in a limited way.

Suggestions

Bearing in mind this scenario, the following suggestions can be put forward in order to move towards education of CWSN in SSA:

i.   Public policies, supportive legislation and budgetary allocations should not be based on incidence, but on prevalence of special education needs, and take into consideration the backlog created as a result of decades of neglect.

ii.   There should be emphasis on bottom-up, school-based interventions as part of regular education programmes following inclusive strategies. The programme should be based on stakeholder participation, community mobilization, and mobilization of NGOs, private and government resources.

iii. Inclusion without adequate preparation of general schools will not yield satisfactory results. It is essential that issues related to infrastructural facilities, curriculum modification and educational materials should be addressed.

iv.   In order to strengthen inclusive practices, networking between existing practitioners would be useful. Simultaneous implementation, and consistent monitoring, reinforcement and coordination between government departments and NGOs at national and state levels will promote education of disabled children under SSA.

v.   The training of general teachers at pre-service and in-service levels should address the issue of education of children with disabilities, so that teachers are better equipped to work in an inclusive environment. Some of the issues in training that need to be addressed includes the methodology to be adopted for identifying children with disabilities; classroom management; use of appropriate teaching methodologies; skills for adapting the curriculum; development of teaching-learning materials that are multi-sensory in nature; evaluation of learning; etc.

vi.   Regular evaluation should be based on performance indicators specified in the implementation programme, and accountability for effective implementation at all levels should be ensured.

vii. The existing handful of teacher trainers cannot reach the vast number of teachers working with CWSN in rural/remote areas. There is a need to explore alternatives such as training Para-teachers, investing in pilot studies to develop tele-rehabilitation programmes, and exploring strategies for distance education.

viii. Orientation training of policy-makers and education department officials, both at the state and block level, is essential. In addition, there is a need to develop on-site support systems for teachers. Grassroot workers, parents, special educators, and other individuals, especially in rural and remote areas, can be shown how to provide the required supports.

Conclusion

The interventions under SSA for education of CWSN are identification, functional and formal assessment, appropriate educational placement, preparation of individualized educational plan, provision of aids and appliances, teacher training, resource support, removal of architectural barriers, research, monitoring and evaluation and a special focus on girls with special needs. There is a need to develop a long-term strategy in which every step taken address to the sound base in order to achieve meaningful results. The school system must change to enable it to respond to the educational needs of the disabled children. For this reason, a changed curriculum that all children can follow should be developed. Teacher education reforms should be undertaken to equip mainstream teachers with appropriate knowledge and skills. Lastly, attention should be drawn to the building of appropriate support systems.

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E-MENTORING FOR PROFESSIONAL DEVELOPMENT

Divya Sharma and Indrajeet Dutta[9]

Abstract

The advancements in Information and Communication Technology (ICT) coupled with the changing needs of the teachers at different levels have created a space for new paradigm for training and professional development. One of the important dimensions of the in-service training programmes is to impart training without withdrawing the teachers from their work places. To meet the needs of capacity building of in-service teachers and make them collaborate successfully, is to provide them with a platform where they can interact with others and learn from their experience and support. Innovative companies and universities are using this implementation for a number of reasons, and to provide effective training to staff and customers on new products and skills. The present paper is an attempt made by the authors to provide 'Continuous Professional Development (CPD)' to the in-service teachers with the help of *e-mentoring* i.e. Web Based Mentoring System (WBMS).

Introduction

Distance Education Programme (DEP) is one of the major interventions in Sarva Shiksha Abhiyan (SSA) focusing on strengthening the training of teachers through distance learning mode (www.depssa.org). This national level project, which is an integral component of SSA aims at providing need-based and local specific in-service training for teachers and other functionaries involved in elementary education programme apart from other activities. The in-service training programmes mainly emphasize on the up gradation of teacher's professional knowledge, pedagogical skills and acquaint them with emerging trends and policy issues in education. Since, the quality of training exerts a great influence on the performance of teachers, the main focus remains on providing effective and quality training to teachers who play an important role in spreading education at different levels in the society. Since one of the important dimensions of the in-service training programmes is to impart training without withdrawing the teachers from their work places, effort is to be made to organize training programmes at their workplace.

Mentoring has proven to be an effective strategy to retain teachers through their first few years of teaching. Mentoring programs that are face-to-face in nature exhibit certain limitations. The distance learning system is designed to provide greater support to the individual learner, allowing everyone the opportunity to speak without conforming to the pressures of "face-to-face" communication and conflict.

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Mentorship is a traditional method of teaching that strengthens the concept and objectives of distance learning. We know that extended face-to-face mentorship is difficult to schedule and prohibitively costly to pay for. The present paper is an attempt made by the authors to provide continuous professional development to these in-service teachers with the help of *e-mentoring* i.e. Web Based Mentoring System (WBMS).

Who's A Mentor?

A mentor is an experienced, successful and knowledgeable professional who willingly accepts the responsibility of facilitating professional growth and support of a colleague through a mutually beneficial relationship. He is simply a knowledgeable individual who can provide guidance, inspiration, and consolation to his or her colleagues. Mentors don't manage; they guide. They offer positive solutions to challenges that other teachers identify in their own classrooms, or to challenges observed in those classrooms. The Oxford Dictionary defines the word 'mentor' as a "*wise counselor*", who tutors the learner in intellectual subjects. Mentors should be-
- competent in the skills they are expected to share;
- respected by their peers;
- able to lead both by modeling outstanding practices in their own classrooms and by guiding other teachers through classroom observations and dialogue.

What Is Mentoring?

Mentoring is defined as the one-to-one support of a novice or less experienced practitioner (mentee) by a more experienced practitioner (mentor), designed primarily to assist the development of the mentee's expertise and to facilitate their induction into the culture of the profession and into the specific local context (Hobson et al,2009). In the context of beginner teacher mentoring, a mentor's efforts to assist the development of expertise will normally focus on the mentee's ability to facilitate learning.

Researches on mentoring have delineated certain potential benefits of mentoring the teachers during their initial career days. Some studies have suggested that mentoring is perhaps the most effective form of support for the professional development of beginner teachers (Hobson et al, 2009). Benefits of mentoring for mentees (i.e. novice teachers) include:
- reduced feeling of isolation,
- increased confidence and self-esteem,
- improved self-reflection and problem solving capacities,
- increased morale and job satisfaction,
- developing capabilities in classroom management skills,
- increased ability to manage their time and workloads,
- increased socialization in order to adapt them to the norms, standards & expectations associated with teaching in general and the specific schools.

Mentoring has also been found to have potential benefits for mentors, such as;
- gaining 'new ideas' and 'new perspectives',
- learning new and improved teaching styles and strategies,
- enhancing in their knowledge and use of ICTs,
- improving their communication skills,
- becoming more self-reflective,
- facilitating an extension of their responsibility for supporting the professional development of other colleagues
- enhanced recognition in their professional community
- improving relationships with pupils and colleagues, including being 'more collegial' , 'more demanding with colleagues' and 'more tolerant with pupils',

Conditions For Effective Mentoring

Hobson et al. (2009) have identified certain conditions that may be more likely to facilitate the achievement of mentoring aims. These relate to-

i) Mentor selection & pairing;
ii) Contextual support for mentoring;
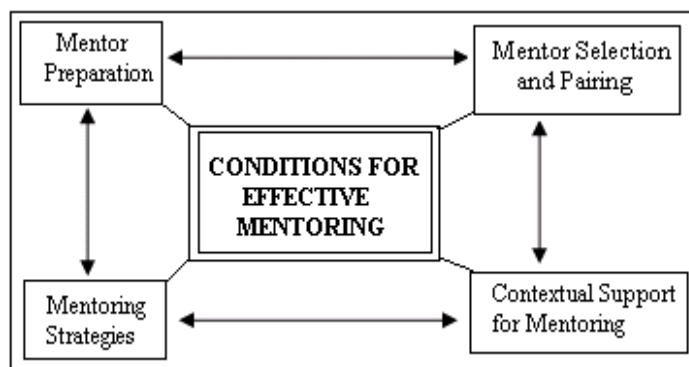iii) Mentor preparation; and
iv) Mentoring strategies.

Figure 1- A diagrammatic representation of conditions for effective mentoring

Mentoring is more likely to be successful where decisions about mentor- mentee pairings take account of mentee's strengths and limitations, and where the mentor and mentee get along both personally and professionally. Like all forms of teaching, mentoring is most effective where it is fit for purpose and is responsive to the needs of the mentee. This means that mentors of beginner teachers should respect their mentees as adult learners, taking account of their individual learning styles and ensuring that the strategies employed to support their learning are responsive to their concerns and appropriate to their current stage of development. Some of the studies have argued from a variety of perspectives that collaborative teaching by teacher-mentors and their mentees, including shared planning and reflection, has great potential to facilitate the early professional learning of beginner teachers. A number of mentoring strategies have been identified among the effective mentors of novice teachers; such as-

1. They provide their mentees with emotional and psychological support, and make them feel welcome, accepted and included.
2. They make time for their mentees, i.e. they meet regularly with their mentees and are 'available' for informal discussion at other times.
3. They allow their mentees an appropriate degree of autonomy to make decisions and to develop their own teaching styles.

4. They undertake lesson observation (both of and by the mentee) with the subsequent analysis of the processes involved.
5. They ensure that their mentees are sufficiently challenged and sufficiently educated about & scaffolded into deeper levels of thinking and reflection, notably about teaching and learning.

Studies have suggested that mentors are more likely to be able to employ effective mentoring strategies where they have undertaken an appropriate programme of mentor preparation. One of the suggested methods is to participate in 'seminars organized around the practice of mentoring', together with other teacher mentors and university teacher educators. Such seminars could operate as 'affinity groups', helping to overcome mentor isolation, facilitating the development of a shared discourse for mentoring and enhancing mentors' skill development through discussions about mentoring practice and pedagogy.

Exploring Dimensions for E-Mentoring of In-Service Teachers

The advancements in Information and Communication Technology (ICT) coupled with the changing needs of the teachers at different levels have created a space for new paradigm for training and professional development. From the last two decades, internet has emerged as a resourceful, user-friendly, prompt, interactive and dynamic medium suitable for multi-user Distance Learning Environments (DLEs). The approach of 'training with technology' would be the demand rather than 'training for technologies'. Web based training is one of the different forms of training which can provide answers to many of the crucial issues pertaining to in-service teachers (Pulist, 2005). The objective of Continuous Professional Development of teachers can be realized by integrating constructivist paradigm of learning, learning organization and ICTs (Senapaty, 2006). This will be made possible by-
- developing greater motivation among the people who are involved in the system,
- making workforce more flexible and creative,
- reducing isolation among teachers,
- making teacher a facilitator of knowledge construction,
- improving social interaction,
- sharing knowledge,
- sharing responsibility for the total development of students and collective responsibility for students' success,
- developing interdependency,
- breaking down the traditional communication barriers,
- changing the role of students, teacher and community,
- providing access to the information resources and focusing on learning with technology, &
- encouraging innovation and creativity in our educational institutions.

The in-service teachers scattered at different places can participate in the training programme in a collaborative manner and get a virtual feeling of training in a group

through the means of web-based DLEs. Almost every type of Distance Learning Environment allows learners to - (i) communicate with experts in a field; and (ii) collaborate with their peers. Providing online in-service education and training could be a step towards empowering the teachers and meeting the new challenges of their profession. Applying e-technologies in the field of education and training demand advanced teaching strategies unlike in face-to-face classroom based teaching. These teaching strategies consist of e-lecturing, e-tutoring, e-mentoring, discussion forums, online structured group activities, online informal peer interaction, etc. Therefore, distance learning environments should be designed in such a manner that they support distance learners and encourage collaboration. One of the essential features for ensuring these conditions is an effective system for e-mentoring of the learners. E-mentoring has also been popularly termed "*tele-mentoring, cyber-mentoring, tele-tutoring* and *on-line mentoring*". Single & Muller (2001) define e-mentoring as:

> "a relationship that is established between a more senior individual (mentor) and a lesser skilled or experienced individual (protégé), primarily using electronic communications , that is intended to develop and grow the skills, knowledge, confidence, and cultural understanding of the protégé to help him or her succeed, whilst also assisting in the development of the mentor" (p108).

E-mentoring uses the power of the Internet to bridge obstacles like time and geography that prevent committed mentors from spending more time with their young friends and often prevent adults from becoming mentors at all. Innovative companies and universities are using this implementation for a number of reasons, and to provide effective training to staff and customers on new products and skills. Most of the open universities around the world have started providing e-mentoring facilities to their learners. There are a number of courses in professional fields like Engineering, Medicines and Management where e-mentoring is being used as an effective strategy of pedagogical practices and student support services. E-mentoring often involves e-mail, but sometimes relies on message boards or special communications software available only to participants. Reflecting the larger world of mentoring, these programs foster one-to-one relationships (one mentor to one mentee) as well as group interactions, such as several engineers advising a classroom of students. Various organizations are involved in giving guidelines and training to the experienced practitioners for strategies employed in e-mentoring (www.mentornet.net*, www.wiziq.com, etc.). One such agency, the Mentoring Leadership and Resource Network is an ASCD (Association for Supervision and Curriculum Development, USA) network dedicated to supporting educators everywhere with best practices in mentoring and induction. For six years, the network has provided assistance and free advice to mentors and mentoring programs.
(http://web.archive.org/web/20040218142739/http://www.ascd.org/publica tions/ed_lead/199905/rowley_link1.html).

Neville et al. (2003) have designed a model for WBMS that can provide a suitable environment to support distance learners and encourage collaboration (Figure-2).
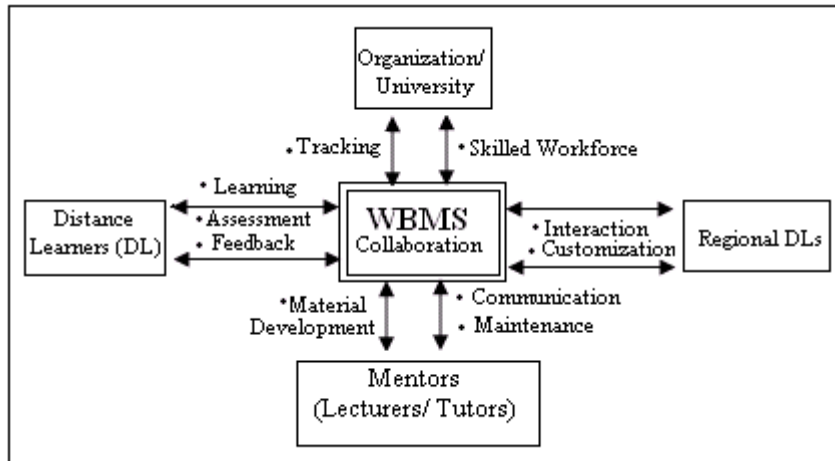
Figure 2- The Web-Based Mentoring Sys34mack, 2003)

This model is based on the following 10 dimensions as identified by Reeves & Reeves (1993) for interactive training and collaboration-

i) *Educational philosophy* - ranging from strict instructivist to a radical constructivist

ii) Training designs based on researched *learning theories* - behavioural and cognitive psychology.

iii) Varying *goals*- ranging from sharply focused to a more general approach.

iv) Orientation of *tasks*- ranging from academic to authentic.

v) *Motivation* as a main factor for success- ranging from intrinsic to extrinsic.

vi) Different *roles* of lecturers and tutors- shift from traditional didactic role of an instructor to the facilitative role.

vii) *Metacognition* as the learner's ability to identify objectives, plan and understand learning strategies- ranging from unsupported to the integrated.

viii) *Collaborative dimension*- ranging from lack of support to the inclusion of facilities to support it.

ix) *Cultural implications*

x) *Structural flexibility*- ranging from synchronous to asynchronous environments.

This model can be effectively utilized for the in-service training needs of teachers and other personnel involved in DEP-SSA. With concerns such as increased numbers of in-service teachers and the word to strengthen the instructor-student association (mentorship), WBMS has emerged as a possible solution to provide them with efficient distance learning environments for professional development opportunities. Graham et al (2005) have identified various requirements for a successful e-mentorship program, that include-

- Participants having access to technology
- Adequate training of participants with technology
- Scanning of mentor candidates

- Agreement of mentor and mentee to a certain number of participation sessions in a given time
- Professional and respectful atmosphere
- Moderator with conflict resolution skills
- Close program development with programmer to promote easy and accessible interfaces
- Numerous mediums to support communication needs (i.e. personal discussion forum, private dyadic discussion, group forum)
- Adequate funding for technology upgrades
- Back-up systems in case of technology errors or lost information
- Reliable server and sustainable virtual space
- IT support available for immediate resolution of technical problems
- Pilot tests and technology function tests prior to use
- Participant feedback and evaluation
- Ability to combine different technologies to adapt to the learning need

The above mentioned model and suggestions are very helpful in the direction to provide a well organized program of e-mentoring for the in-service teachers (specially the novice teachers and under-qualified staff).

- An e-mentoring database can be developed to provide a platform to all the distance learners under DEP-SSA initiatives.
- Experts from pedagogical areas, teacher education, school administration as well as senior teachers working in various schools and lecturers / teacher educators would be involved and prepared for implementing mentoring strategies for online learning environments. Successful mentoring would depend upon their careful selection and preparation for this challenging work environment.
- Novice as well as under-qualified teachers (mentees) involved in the capacity building programs of DEP-SSA would be asked to become registered members in order to avail an access to the resources & mentor's guidance.
- Users of this web-based mentoring system would be given vast opportunities to interact and collaborate online with their mentors. It also enables the tutors and learners to collaborate, therefore, providing 24-hour support environment.
- Mentees (in-service teachers) can receive direct instructions (generally based on knowledge & experience of mentors) from their mentors or they may be motivated to build their own knowledge base (e.g. through discussion forums).
- A number of multimedia inputs would be added to enrich the online distance learning environments for an effective mentoring and support to the mentees.
- A collaborative environment would be the core of this web- based mentoring system which will enable teachers (mentees) to work and share ideas with one another, while still supporting the needs of the individual learner.

- A contextual WBMS would be more efficient to provide mentees with required support and collaboration. It should be as culturally aware as possible to become more authentic and relevant for the target group i.e. in-service teachers under DEP-SSA project.
- Working design of the *e-Mentoring System* (i.e. Web-Based Mentoring System) can be explained with the help of the following flow chart (Figure 3).
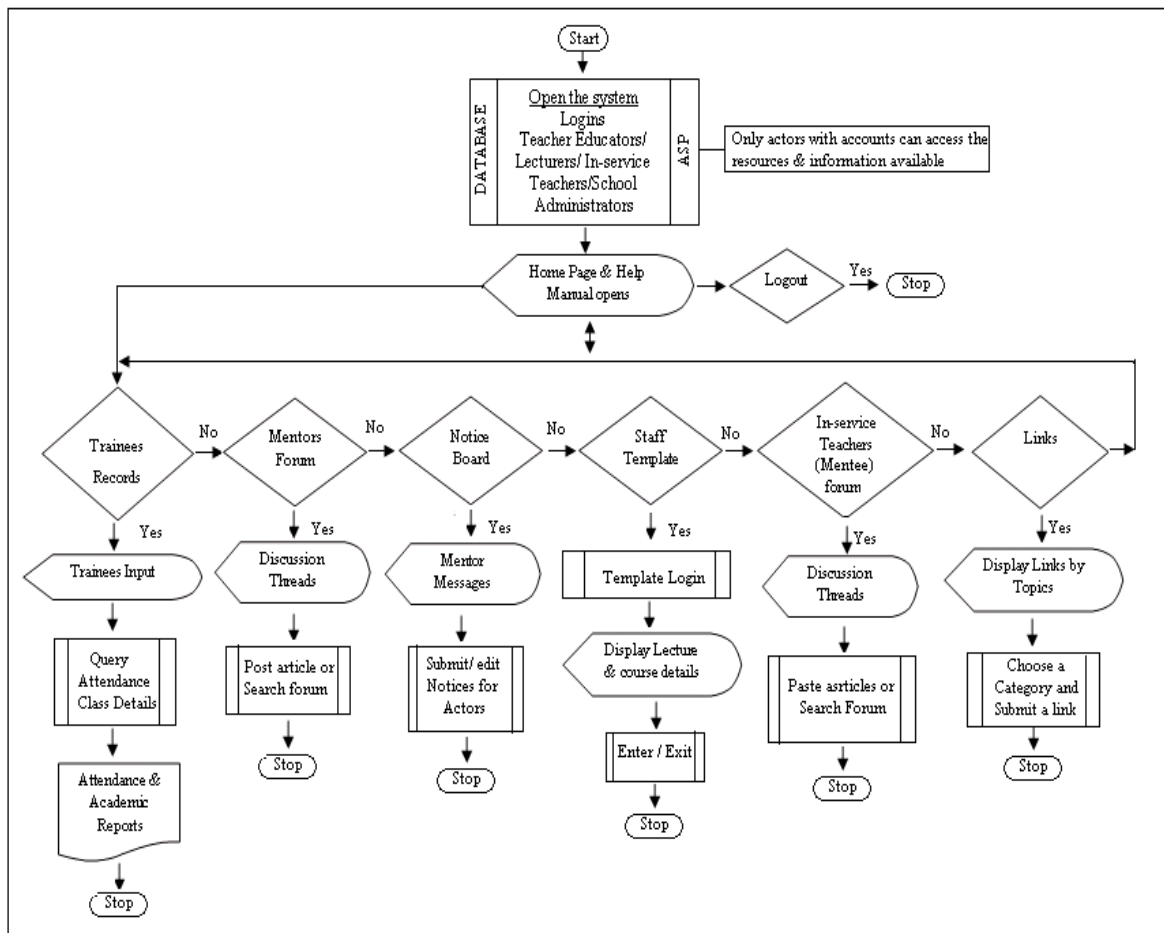

Figure 5. WBMS for In-Service Teachers (Adopted from Neville, Adam & McCormack, 2003 & modified)

Conclusions

Researches on mentoring have delineated certain potential benefits of mentoring the teachers, especially during their initial career days. The traditional approach to training and education has always incurred criticism regarding its various identified constraints. Thus, upcoming trend in the filed of Distance and Open Learning is to provide online education & training to fulfill the demands of *life long learning* and *continuous professional development of teachers*. One of the approaches, to meet the needs of capacity building of in-service teachers and make them collaborate successfully, is to provide them with a platform where they (i.e. mentees) can interact

with mentors and learn from their (i.e. mentor's) experience and support. E-mentoring through a carefully designed distance learning environment (DLE) would be a successful strategy for realizing this objective. It has a promising role to play in the field of in-service teacher education and training. The only need is to explore the vital issues related to e-mentoring and its effective implementation. It is obvious that there will be some *inhibitions* in terms of favourable attitude and *readiness* in terms of infrastructure and skills required for its successful implementation.

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SCOPE OF RADIO PROGRAMMES AND ROLE OF RADIO PHONE-IN CONFERENCE IN CAPACITY BUILDING – A CASE STUDY OF KARNATAKA STATE

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Abstract

The globalised society demands for knowledge based society. A country like India, which is rich in resources both natural and human can work to exploit the circumstances. For this purpose the human resource has to be made knowledgeable and aware of the latest developments. India has worked seriously in spreading education to the masses in the country. Various schemes, programmes and projects were implemented. To reach the unreached the Distance Education Component was also brought in during implementation of DPEP. On the one hand, the complex, sophisticated media like computer and internet were used and on the other hand the age old media like print and radio were also revived for training of the field functionaries. The radio is a mode of oral communication, which was more systematically utilised in the programmes like DPEP and SSA. There are number of studies which have been carried out to show the potential of the media, which are mentioned in the article. Based on the suggestions and recommendations of the studies on radio programmes, the Distance Education Programme of DPEP Karnataka ventured into the Keli-Kali or Listen and Learn radio programme series which was launched on children's day from All India Radio, Gulbarrga (14.11.2000). These programmes had profound impact which resulted in imitation of such interventions in neighbouring states like Andhra Pradesh and Maharashtra etc. The state of Karnataka further ventured into live interaction with field functionaries like BRCs, CRCs, teachers, parents, community members and students. They interacted with the centrally located studio in a live radio programme through phone. The responses could be heard by stakeholders and public at their respective locations. These interactions have helped in sharing of thoughts and training of field functionaries. This media has scope for coverage of all most all the geographical locations within the coverage region. At the same time cost incurred is very meagre. The experts could be brought to the remotest part of the state and concerns of the far flung areas could reach the authorities through radio phone-in conferene. Thus, this mode of interaction was found to be very effective. This article / paper presents the status of radio programmes in the country with special emphasis on importance in the field of education. An attempt is made to present the design adopted in the radio phone in conference in Karnataka. This has been examined from the point of view of educational perspective as a c6ase study.

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Introduction

India is a vast country with diverse needs. The educational needs differ from place to place and state to state. To meet all such local specific needs and needs of the nation to achieve Universalisation of Elementary Education, the Government of India has made ground work by bringing schemes like Operation Black Board (OBB), Janashala, District Primary Education Programme (DPEP) I and II, Sarva Shiksha Abhiyan (SSA) and have extended its scope to secondary schools now. The above mentioned projects have brought various interventions like reduction in pupil-teacher ratio, expanding of schools, classroom, supply of free text books, taking up of civil works, teaching learning classroom equipments, sanction of teacher grants, training of teachers and trainers, setting up of SIEMAT etc. It is evident that the capacity building of teachers, Block Resource Centres (BRCs), Cluster Resource Centres (CRCs), officials, community leaders and other concerned is also important in all the above mentioned interventions. The new interventions like micro planning, house hold survey, community mobilisation, new programmes for Integrated Education for the Disabled etc. also need training of field functionaries. The training provided in cascade mode takes longer duration and the transmission loss is also evident. Hence, the SSA and its predecessor DPEP have brought distance mode of education through DEP-DPEP and DEP-SSA project. These programmes train the functionaries for development of print and non-print material. Self-Instructional Materials (print material) are developed in the workshop. Non-print material (like audio, video, teleconferencing programmes) are also developed through distance mode. One of the authors has worked as the Distance Education Co-ordinator at DPEP and SSA Karnataka. During his stint at DPEP in Karnataka, the state has developed 18 self instructional materials, 223 radio programmes, a proposal for video programmes later named as EDUSAT for schools, and several teleconferences / radio conferences. In addition to this the progress was researched and documented. All the activities mentioned above are distance interventions that incur less cost. Among different media available for distance mode of teaching and training, radio is readily and cheaply available media. It is the opinion of the authors that the radio phone-in conference is also an effective (in the form of cost, time and result) mode of delivery of programmes.

Review Of Related Studies

The audio and radio mode is being utilised for a long time. The first radio signal was tested by Guglielmo Marconi in 1895. Since, then the radio was utilised mainly for imparting education and information. A priest from coastal America has utilised radio broadcast to preach the fishermen who went to sea for fishing. Now, in India the radio produces and transmits programs relating to developmental activities in all the faculties including extension work in agriculture, education, health and family welfare and science and technology.

There are 231 All India Radio stations across the nation which has 372 transmitters. These stations include all Short wave, FM, Medium Wave and DTH services and

cover the entire width and breadth of the nation. Prasar Bharati is a statutory autonomous body established under the Prasar Bharati act. The Board came into existence from 23.11.1997. The prasar bharati is the public service broadcaster of the country. The objective of public service broadcasting is achieved through All India Radio and Doordarshan which earlier were working as independent media units under the Ministry of Information and Broadcasting.

Patel (2003) says that the cost of broadcast of 30 minute programme ranged from Rs. 8000/- to Rs. 13500/-. The cost of production of programme was Rs. 10000/-. Hence, the total 30 minute radio programme cost less than any other format of distance programme. Such programmes, if produced at one end and transmitted from two powerful stations could cost about 2x13500+10000=37000 Rupees for half an hour of programme each. Two such stations can cover a population of about 5.00 lakh students and the cost per candidate can go upto a fraction of a paise.

Sudame (1988) has found that the radio programmes use talk, dialogue and discussion format. ET Cell (1989) has found that there is demand to make available the programmes in Science, Mathematics, Languages and Educational Psychology. Mishra (1989) found that the songs, stories of eminent personalities have created enthusiasm in radio listening. Mohanty (1990) has found that the 'gains' reveal that the difference between the experimental and control group were significant and the difference between rural and urban was found to be highly significant. Chowdhary, (1990) has shown that the children of experimental group in the study of 'Khilte Phool' outshone the control group in listening comprehension, sequential thinking, recall and vocabulary, concept of colour and shape, awareness of immediate environment, awareness of heritage and verbal expression. Giri (1990) has found that more number of urban schools than their rural counterparts had made provision for radio listening in the time table and this has resulted in similar fashion in radio listening aspects too.

Based on the above studies in my mind the DPEP Karnataka plans for such content-based radio programmes, which can be broadcast during the school hours for the benefit of both teachers and students. The programmes were christened as "Keli-Kal" or "Listen-n-Learn". These programmes were prepared by the teachers under the supervision of subject and media experts. The production was carried out under the supervision of media experts at AIR by the school teachers and students. These programmes contained talk, dialogue, discussion and songs. The content areas from Mathematics, Environmental Science, and Languages were covered. The instructions were issued to the schools regarding making arrangements of radio for listening. Thus, the urban, rural disparity found in the study of Giri (1990) among schools was overcome.

Prakruthi (2002) has found that the achievement and attendance of students have improved with the interventions of Keli-Kali programmes. The handbooks were supplied in time which helped the teachers in carrying out pre and post broadcast activities.

Patel (2006) has made an exhaustive study of Keli-Kali radio programmes in Karnataka. His study reveals the following aspects,

1. The Keli-Kali Radio programmes developed by the DEP-DPEP and others were effective to learn Environmental Studies (EVS) properly.
2. The students of III and IV standard learnt EVS through the Keli-Kali Radio Programme achieved significantly more than those who learnt through traditional method.
3. The students when taught through the Keli-Kali Radio programme have achieved significantly more than the previous year (II and III standard respectively), which means that the Keli-Kali radio programme material helped the students to learn better than the previous year.
4. The boys when taught through Keli-Kali Radio programme have achieved significantly more than those taught through traditional method both for III and IV standard EVS.
5. The girls when taught through Keli-Kali Radio programme have achieved significantly more than those taught through traditional method both for III and IV standard EVS.
6. Both boys and girls have equal affinity to learn through Keli-Kali radio programme for III and IV standard.
7. The teachers who taught through Keli-Kali radio programme method expressed that, themethod is better than that of traditional method to teach EVS for III and IV standard.
8. The students who learnt through Keli-Kali radio programme have also expressed their satisfaction, but they have expressed that this may be supplementary to the traditional method.

Phalachandra (2003) has found improvement in education achievement, school performance, teacher transaction of curriculum and teachers personality. Interschool communication and competitions were developed.

In the review it was first time observed that the school interacted with each other. Radio phone-in conference became the important means of interaction among the schools. This concept was the emerging area in the DPEP period. The authors examine this intervention in the context of DPEP and present it as a case study. It may be noted that the DPEP Karnataka had conducted about 7 radio phone-in conference till the completion of DPEP programmes.

Methodology

Following are the broad guidelines for various offices for making necessary arrangements.

State Project Office:

- Identification of themes, sub-themes for conference
- Identification of Resource Persons, Experts
- Identification of AIR stations
- Identification of blocks / talukas
- Identification of stakeholders
- Release of funds and their final settlement from both receiving end and broadcast end
- Supply of time schedule

All India Radio (AIR):

- Setting up of system
- Provision for receipt of phone calls
- Provision for recording of programmes
- Provision of recording of programmes
- Arrangement for recording of monitoring

Block Resource Centre (BRC):

- Intimation to all the stake holders about the venue and time.
- Supply of Self-Instructional Material (SIM), stationery and discussion on core issues
- Arrangement of listening to the programme
- Registration of the candidates
- Performing the activities specified in the schedule
- Arrangement of lunch, tea, snacks etc.
- Interaction with the studio and responding

Following are the stages involved in the conduct of radio phone-in conference.

Planning:

The planning of the programme was at SPO, BRC and AIR level. The core committee consisting of officials from different institution participated to finalise dates, themes, time and location, stakeholders and resource persona and activities pertaining to each of the conference. The institutions offered one nodal officer from their side for co-ordinating the activities. The expenditures were estimated and strategies were developed for smooth conduct of the programme.

Management:

A nodal officer from the state office (i.e. Distance Education Co-ordinator) and state incharge (i.e. Programme Officer from Delhi co-ordinated the programme with a

district official and an official from the AIR. All the officers were to conduct respective duties of their department before, during and after the conduct of the conference. During the actual implementation it was observed that the national, state, district, AIR officials and experts were present in the studio for conduct of programmes. The BRCs along with the stake holders were present at the receiving ends.

Following design was adopted in radio phone-in conference.

Transmission end   Receiving End
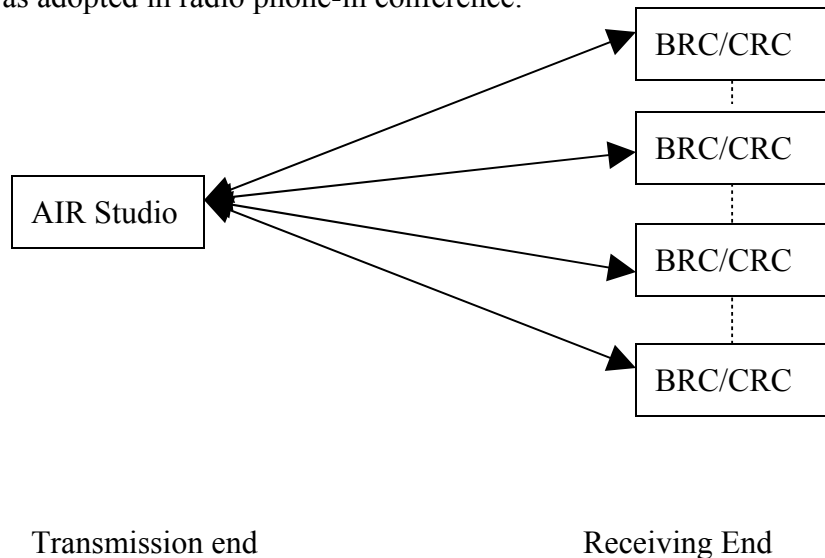
Transmission End (AIR Studio)

Human Resources – Resource Persons, Producers, Co-ordinators
Equipments – Receiving phone, Mixing Machine, Pre-recorded cassettes, Music, Jingles, Expert Talk transmission facility etc.

The AIR studio was a transmission end which initiated the communication. The resource persons (about 4-5) interacted on a theme specified for the talk. Both female and male subject experts participated in the talk. The number of resource persons was kept below 5 so that the drawback of audio (voice only) media could be reduced. One person acted as an anchor for the programme to moderate the session and keep track of time. He gave ample time for speakers at the receiving and transmission end keeping a judicious balance and channelising them on specified path or theme.

Receiving End (Block Resource Centre, Cluster Resource Centre)

Human – Resource Persons, Co-ordinators, trainees
Equipments/Instruments – Radio, Telephone, Blackboard, Charts/Design, SIM (if any)

The receiving end had a co-ordinator who monitored and supervised the entire process of radio phone-in conference. He was expected to supervise the pre-programme activities like arrangement of communication to trainees (stakeholders), arrangement at the receiving end, registration, food, water, snacks, stationeries, arrangement of resource persons for co-ordination and supply of SIM. Keeping the instruments intact and in working conditions was the prime responsibility of the co-ordinators at the receiving end.

Interaction

Traditionally the radio was used as a media of preaching. It was then used for supply of information and entertainment. Thereafter, it was used in bringing educational programmes having songs, interactivity inbuilt into it. Now, the dissemination and receiving ends can interact with each other which is not only useful for these two-ends but can be heard with other similar receiving ends which have uniform problems.

Advantages of Radio Phone-In Conference

- Locally available personnel can be trained
- No investment on heavy gadgets
- Experts need not visit all the places
- Large number of days spent in training through cascade or face to face mode could be reduced

Certain Issues Which Can Be Discussed In the Radio Phone-In Conference

- Role of panchayati raj institutions in Universalisation of Elementary Education
- Integrated Education for the disabled
- Teachers' training for new syllabus, methodologies
- Bridge course training
- Training for civil works
- School upliftment programme training
- Induction training for teachers
- New Methodologies of teaching
- Gender equity issues
- Arrangement of mid-day meals scheme
- Activity based teaching and evaluation

Now, there is a flood of public and private broadcasters. It is seen that community radio channels such as Stree Shakti Community channel of Zaheerabad, Andhra Pradesh are launched. Private FM radio stations like Radio Mirchi are launched. Public broadcasters have also expanded their services. Educational radio stations have come up with the help of open Universities like IGNOU. Other Universities are also planning to make use of these services. In a scenario like this there is a need to study

the live and recorded programmes being broadcast. The content, intent and impact have to be found out. The planning, management and co-ordination have to be studied. The ease efficacy, efficiency, effectiveness of radio programmes and radio phone-in conference has to be studied with seriousness in the era of recent technologies like teleconferencing (two-way audio, one-way video and both way audio-video). Online Computer Conferencing, chatting, Video Call/Conferencing, Mobile Television, Multimedia intervention in mobile, Video on Demand, Faster video streaming, High speed Internet, DTH services, flood of media channels, on-line papers etc. AIR informs in its website that even today the Radio reaches 35.7 crore homes. All these indicate the vastness of the areas of the study of radio programmes.

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ASSESSMENT IN A CONSTRUCTIVIST LEARNING ENVIRONMENT

-Harjeet Kaur Bhatia[12]

Abstract

Teaching future elementary teachers to teach requires making choices and taking positions from among the multiple pressures placed upon teacher educators. Pressures from licensure agencies like NCTE, accreditation institutions like NAAC, and the positions of practicing teachers- collaborators in the teacher education process from various disciplines like philosophy, sociology, economics etc. add further complexity to the frameworks within which teachers are prepared to teach. The latest catchword in educational circles is "constructivism," applied both to learning theory and to epistemology-both to how people learn, and to the nature of knowledge. This article is about classroom assessment—not the kind of assessments used for certification or to satisfy the accountability demands of an external authority at institution, state or national level but rather the kind of assessment that can be used as a part of instruction to support and enhance learning. A complementary relationship exists between technology and constructivism, the implementation of each one benefiting the other. Constructivism is a doctrine stating that learning takes place in contexts, while technology refers to the designs and environments that engage learners. The article is divided in two sections. In the first section I will discuss about constructivism emerging as a popular paradigm in teacher education. In the second section the focus would be on assessment with special emphasis on assessment in constructivist classroom.

Introduction

As educators are changing their ideas about what constitutes exemplary inquiry-based learning, and recognizing that learning is an active process that encourages higher-order thinking and problem solving, there is an increased need to align curriculum, instruction, and assessment. Classroom assessment techniques are focusing on aligning assessments more closely with the instructional strategies actually used with learners. Classrooms that promote understanding of ideas are those in which the teachers take on the role of monitor of student learning, making sense of their students' sense-making. In these classrooms teachers take a stance as researchers of student understanding. In these classrooms, the pedagogy enacted by the teacher, the approach to knowledge as constructed by the learner, and the culture of the classroom represent a setting never experienced by most of the future teachers as students. However, assessment for learning is an aspect of the work of all teachers. Assessment is a process of judging. In education it involves making a judgement about the work

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of pupils. These judgements can be made by the teacher, in which case they will be teacher assessments; by the pupils about each others' work, in which case they will be peer assessments; or an individual pupil about their own work, in which case they will be self assessments. New practices in teacher education also aim to prepare teachers as agents of social change. These practices are grounded in the belief that teachers should orchestrate the classroom environment in ways that promote equity and social justice, and that teachers should model democratic education.

Constructivism

Constructivism is a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. Each of us generates our own "rules" and "mental models," which we use to make sense of our experiences. Learning, therefore, is simply the process of adjusting our mental models to accommodate new experiences. The term refers to the idea that learners construct knowledge for themselves-each learner individually (and socially) constructs meaning-as he or she learns. Constructing meaning is learning; there is no other kind. The dramatic consequences of this view are twofold;
1) we have to focus on the learner in thinking about learning (not on the subject/lesson to be taught):
2) There is no knowledge independent of the meaning attributed to experience (constructed) by the learner, or community of learners.

Constructivism Focuses On Knowledge Construction, Not Knowledge Reproduction. "Constructivism is a theory of learning, and it is also a theory of knowing. It is an epistemological concept that draws from a variety of fields, including philosophy, psychology, and science" (Walker & Lambert, 1995 p. 1). Constructivism is not a new concept. It has its roots in philosophy and has been applied to sociology and anthropology, as well as cognitive psychology and education. Perhaps the first constructivist philosopher, Giambatista Vico commented in a treatise in 1710 that "one only knows something if one can explain it " (Yager, 1991). Immanual Kant further elaborated this idea by asserting that human beings are not passive recipients of information. Learners actively take knowledge, connect it to previously assimilated knowledge and make it theirs by constructing their own interpretation (Cheek, 1992). If we accept constructivist theory (which means we are willing to follow in the path of Dewey, Piaget and Vygotsky among others), then we have to give up Platonic and all subsequent realistic views of epistemology. We have to recognize that there is no such thing as knowledge "out there" independent of the knower, but only knowledge we construct for ourselves as we learn.

Focusing on a more educational description of constructivism, meaning is intimately connected with experience. Students come into a classroom with their own experiences and a cognitive structure based on those experiences. These preconceived structures are either valid, invalid or incomplete. The learner will reformulate his/her existing structures only if new information or experiences are connected to knowledge already in memory. Inferences, elaborations and relationships between old

perceptions and new ideas must be personally drawn by the student in order for the new idea to become an integrated, useful part of his/her memory. Memorized facts or information that has not been connected with the learner's prior experiences will be quickly forgotten. In short, the learner must actively construct new information onto his/her existing mental framework for meaningful learning to occur. The role of the teacher is to organize information around conceptual clusters of problems, questions and discrepant situations in order to engage the student's interest. Teachers assist the students in developing new insights and connecting them with their previous learning. Ideas are presented holistically as broad concepts and then broken down into parts. The activities are student centered and students are encouraged to ask their own questions, carry out their own experiments, make their own analogies and come to their own conclusions.

There are several guiding principles of constructivism:
1. Learning is a search for meaning. Therefore, learning must start with the issues around which students are actively trying to construct meaning.
2. Meaning requires understanding wholes as well as parts. And parts must be understood in the context of wholes. Therefore, the learning process focuses on primary concepts, not isolated facts.
3. In order to teach well, we must understand the mental models that students use to perceive the world and the assumptions they make to support those models.
4. The purpose of learning is for an individual to construct his or her own meaning, not just memorize the "right" answers and regurgitate someone else's meaning. Since education is inherently interdisciplinary, the only valuable way to measure learning is to make the assessment part of the learning process, ensuring it provides students with information on the quality of their learning.

Constructivist Teaching Strategies

Learning should involve activities to process the new material, linking it to what the student already knows. Tasks should be authentic, set in a meaningful context, and related to the real world. They should not just involve repeating back facts as this causes 'surface' learning. As student's learning will involve errors, tasks should offer opportunities for self-assessment, correction, peer discussion, teacher feedback and other 'reality checks'.

In constructivist paradigm teachers' close assessment of students' understandings, feedback from peers, and student self-assessments would be a central part of the social processes that mediate the development of intellectual abilities, construction of knowledge, and formation of students' identities.

Assessment In Constructivist Classroom

Assessment can be defined as a sample taken from a larger domain of content and process skills that allows one to infer student understanding of a part of the larger domain being explored. The sample may include behaviors, products, knowledge, and performances. Assessment is a continuous, ongoing process that involves examining and observing children's behaviors, listening to their ideas, and developing questions to promote conceptual understanding. The term authentic assessment is often referred to in any discussion of assessment and can be thought of as an examination of student performance and understanding on significant tasks that have relevance to the student's life inside and outside of the classroom. Constructivism is the idea that learning is an active process of building meaning for oneself. Thus, students fit new ideas into their already existing conceptual frameworks. Constructivists believe that the learners' preconceptions and ideas are critical in shaping new understanding of concepts. Assessment based on constructivist theory must link the three related issues of:

* student prior knowledge (and misconceptions or alternative conceptions),
* student learning styles (and multiple abilities),and
* teaching for depth of understanding rather than for breadth of coverage.

For example :
>   Teacher: 'Is 7 a prime number?'
>   Student: 'Yes'
>   Teacher: 'Why?
>   Student: 'Because it's odd.'

'Rabindra Nath Tagore wrote many poems and plays, and also wrote literature'

These genuine mistakes show 'meaning making' in practice. If students just remembered what they were told, they would not make such mistakes, they would either remember or not. Conceptual errors show that we make our own mental constructs, we don't just remember other people's.

 Meaningful assessment involves examining the learner's entire conceptual network, not just focusing on discreet facts and principles. Assessment to the constructivist then, examines the way students construct their knowledge. That is, the assessment item will challenge and develop the student's ability to think in novel situations rather than simply regurgitate standard answers or undertake standard procedures (Wiggens, 1989). Assessments based on constructivism seek to assist students to understand the concepts of the discipline, foster pleasure and mastery of their use, as well as motivate students to undertake these activities. An important component of constructivist theory is to focus a child's education on authentic tasks. These are tasks which have "real-world relevance and utility, that integrate those tasks across the curriculum, that provide appropriate levels of difficulty or involvement" (Jonassen, 1991, p. 29). It would be impossible for us all to become masters of all content areas, so "instruction is anchored in some meaningful, real-world context"

The ideas about assessment in construvtivist classroom can be listed as follows : Assessments are in a meaningful context that is relevant or has emerging relevance to students . The process of learning does not shut down during assessment . Formal assessments are tailored to specific modules and teaching situations . Assessments include higher order thinking skills, i.e., application, evaluation, analysis, synthesis . Assessments include application of knowledge and comprehension . A range of techniques is used in assessments . Assessments focus on the big pictures on concepts and on issues and their accompanying facts and evidence . It includes inquiry . Students go beyond initial information levels (knowledge and comprehension) through elaboration doing in-depth analysis of big ideas, issues and concepts . They solve problems in which they extend and re-conceptualize (accommodate) knowledge in new contexts and generalize (synthesize) experiences from earlier concrete experiences a to understand abstract theories and applications . Students exhibit knowledge through application and interact with each other in all circumstances including during assessments

In constructivist classrooms teachers follow a number of practices that add breath to the assessment environment. They include (a) teachers do not feel restricted to text-embedded assessments, (b) teachers ask for student input, (c) teachers use questioning strategies to assess students' prior knowledge, (d) teachers incorporate knowledge of a larger picture into assessment and instruction, and (e) teachers use a variety of inquiries. Teachers listen to the student voice in this assessment environment . They engage and present highly valued, student directed formative and summative assessments . Teachers use questioning strategies to assess student prior knowledge . Response to questions can reveal what students already know and what their beliefs are. Inquiry is the heart of the constructivist classroom. Using inquiry helps increase scientific understanding and reasoning Inquiries include those that are examples of: the strength of observations, how to accommodate new knowledge into a larger picture, and how results are validated. The constant internal influence on the assessment environment is the teacher's curiosity and the need to find a solution to the statement, "there's got to be a better way." Teachers report that networking with other teachers and professionals is a source of new ideas . Teachers enjoy "kicking around ideas" with others and working as a team. Interactions with others and intrinsic motivation leads teachers on a journey of change. Motivating factors for change focus on never being satisfied with the status quo. They seek new methods that will help them improve their teaching and assessment practices; the search for new ideas from educational research because they are life-long learners. They seek information from a variety of places like: workshops, courses, magazines, conferences, study groups, mentors, professors, discussions, their own children, feedback from students, the cooperating teacher etc.

Teachers use a variety of assessments to make up a student's grade. Variety in this case does not mean sheer numbers. Variety means that different kinds of items make up assessments (Brooks & Brooks, 1993; Wiggins, 1997) . This assumes that the teacher is aware of how students learn best and that the teacher wants students to

grow in competence in a variety of learning situations (Brownstein, 1996; Caine & Caine, 1991) . Students are given multiple opportunities to show their competence and have opportunities to gain experience in styles where they are not so competent. Variety means visual, performing, writing, talking, designing, and presenting knowledge as individuals and in groups (Champagne & Newell, 1992) . Variety also means that grades are a profile of many areas of competence that may include: concepts, inquiry, application, creativity, attitude, and a world view (Yager & McCormack, 1989) . Effort that reflects engagement, motivation, and ultimately attitude expands variety beyond achievement.

The Purpose Of Assessment

Critical to educators is the use of assessment to both inform and guide instruction. Using a wide variety of assessment tools allows a teacher to determine which instructional strategies are effective and which need to be modified. In this way, assessment can be used to improve classroom practice, plan curriculum, and research one's own teaching practice. Of course, assessment will always be used to provide information to children, parents, and administrators. In the past, this information was primarily expressed by a "grade". Increasingly, this information is being seen as a vehicle to empower students to be self-reflective learners who monitor and evaluate their own progress as they develop the capacity to be self-directed learners. The Constructive Learning Design emphasizes these six important elements: Situation, Groupings, Bridge, Questions, Exhibit, and Reflections. These elements are designed to provoke teacher planning and reflection about the process of student learning. Teachers develop the situation for students to explain, select a process for groupings of materials and students, build a bridge between what students already know and what they want them to learn, anticipate questions to ask and answer without giving away an explanation, encourage students to exhibit a record of their thinking by sharing it with others, and solicit students' reflections about their learning.

Described below is tabular representation of certain assumptions of constructivism along with the change that is required in respect of teachers and curriculum transaction. Teacher education institutions should focus on these areas to build capacity of inservice and future teachers to be ready to take up the job required by them efficiently.

Assumptions	Consequences
Learners must be allowed to construct their own understanding.	The educator will contribute towards the development of the learner's higher cognitive skills.
Assessment tools cannot focus on "right" or "wrong" anymore.	Assessment of the understanding must therefore focus on the learner's reasoning (synthesis and evaluation).

Fellow learners play a major role in the development of knowledge and skills of the individual.	Collaborative ways of teaching must be developed to allow for towards discussion, clarification of their own ideas and evaluation of others' ideas.
Standardised curricula have to change.	New curricula have to address the "gap" between the learner's previous experience and new learning experience and should focus on problem solving models.
Teaching strategies have to change.	The teaching philosophy should be one of facilitation and interaction in order to allow for the construction of own understanding and meaning.

To accomplish the kind of transformation envisioned, we have not only to make assessment more informative, more insightfully tied to learning steps, but at the same time we must change the social meaning of assessment. Our aim should be to change our cultural practices so that students and teachers look to assessment as a source of insight and help instead of an occasion for meting out rewards and punishments. Assessment of student learning is of two types: formative and summative. Each of these strategies serves a social, motivational purpose as well as a cognitive, informational one. None of these strategies by themselves will be effective if they are not part of a more fundamental shift in classroom practices and expectations about learning. Formative assessment occurs during learning and provides feedback to the student. It includes assessment of ongoing portfolios, and demonstrations of work in progress. Student collaboration also provides a form of formative assessment.

In the paragraphs that follow, I summarize briefly several specific assessment strategies: dynamic assessment, assessment of prior knowledge, the use of feedback, teaching for transfer, explicit criteria, student self-assessment, and evaluation of teaching.

1.   Dynamic, On-Going Assessment

In order for assessment to play a more useful role in helping students learn it should be moved into the middle of the teaching and learning process instead of being postponed as only the end-point of instruction. Dynamic assessment is an interactive approach to conducting assessments within the domains of psychology, speech/language, or education, that focuses on the ability of the learner to respond to intervention. Dynamic assessment— finding out what a student is able to do independently as well as what can be done with adult guidance—is integral to Vygotsky's idea of a zone of proximal development (ZPD). This type of interactive assessment, which allows teachers to provide assistance as part of assessment, does more than help teachers gain valuable insights about how understanding might be extended. It also creates perfectly targeted occasions to teach and provides the means to scaffold next steps. Although formal dynamic assessments are assumed to involve

an adult working with only one child, these ideas about social mediation of learning can be extended to groups, especially if students are socialized into the ways of talking in a community of practice and become accustomed to explaining their reasoning and offering and receiving feedback about their developing competence as part of a social group.

Four methods for dynamic assessment to get at the child's best performance or understanding are:

Testing The Limits - Traditional test procedures are modified by rephrasing the question, posing it differently, or encouraging the child to show what s/he knows. In dynamic assessment, the examiner would go beyond simple feedback (saying "That is correct") to elaborate feedback (ask the student to provide the reasons why the answer is correct). Example: When testing vocabulary, if English language learners (ELLs) get the word correct, say "Good, why did you say that?". If they miss the word, explain why the response was incorrect and ask them to try again.

Clinical Interview - A form of testing the limits, clinical interviewing allows for modifying the administration of a test to generate questions to help children understand how they are thinking about a test question to facilitate their awareness of targeted skills. Example: During testing, the examiner would ask the learner "How did you know this?" or "What would happen if..." in an attempt to understand why they responded like they did.

Graduated Prompting - In an attempt to identify the ZPD, the student is provided a series of verbal clues that are graduated in difficulty from the easiest to the most difficult. The examiner focuses on that point where the student is able to demonstrate knowledge/proficiency, judging the distance on a continuum (no transfer, near transfer, far transfer, very far transfer). Example: In language proficiency testing, the student who is in the Silent Receptive stage and can only produce one-word responses is prompted, "This is a baby", then asked, "What is this?", then prompted, "Ask me what is this" (in reference to the picture of a baby).

Test-Teach-Retest - The examiner provides an intervention designed to modify the student's level of functioning in the target area. By first assessing, then teaching the principles of the task, then assessing again, the examiner can determine the extent of learning that occurs. Example: learners in may be asked to tell a story about a picture book and the examiner evaluates the use of story ideas, structure, and language. Then teaching occurs in which the examiner targets two areas in which the student had difficulty. Finally, the student is asked to re-tell the story and the test-retest gains are assessed along with ratings of listener effort, responsiveness, and modifiability.

2.   Implementation of Cooperative rather than Individual Learning and Assessment

In many traditional classrooms, cooperative learning would be frowned upon, or might even be viewed as 'cheating' . Constructivism puts cooperation and mutual exploration at the top of the list. This frees students to bounce ideas off of one another, and fosters learning-in-dialogue rather than learning-in-isolation. Peer assessment can also be undertaken where learners weigh each others ideas and help themselves in learning a concept. Open discussion or "instructional conversations" are more likely to elicit a more coherent version of students' reasoning and relevant experiences and can be a much more productive way for novice teachers to learn about the resources brought by students from diverse communities. Assessment of student learning is of two types: formative and summative. Formative assessment occurs during learning and provides feedback to the student. It includes evaluations of ongoing portfolios, and demonstrations of work in progress. Student collaboration also provides a form of formative assessment. The perceived benefits to a constructivist learning environment include holistic learning opportunities, the enhancement of collaborative/cooperative skills and time and appreciation for metacognitive reflection

3.   Feedback

We take it for granted that providing feedback to the learner about performance will lead to self- correction and improvement. However it should not consist of reporting of right and wrong answers to the learner rather we have to use it for scaffolding purposes sometimes making feedback indirect also. The most helpful type of feedback encourages students to focus their attention thoughtfully on the task rather than on simply getting the right answer . Feedback is more effective when it provides information on correct rather than incorrect responses and when it build on change from previous trials. This type of feedback may be particularly helpful, because it emphasizes that students can improve as a result of effort, and *specifically shows pupils how to go about achieving that improvement*. This is based on thoughtful questions, careful listening and reflective responses. Feedback also has to be timely as regards the quality of learner work and how to make it better I.e. it should help the learner to know how to improve. Feedback has to be sensitive and constructive.

4.   Transfer

There is a close relationship between truly *understanding* a concept and being able to *transfer* knowledge and use it in new situations. Good teaching constantly asks about old understandings in new ways, calls for new applications, and draws new connections" (Shepard, 1997, p. 27). And good assessment does the same. For example, very young children learn to speak in the very context in which they live. Parents, caregivers, friends and siblings turn everything they touch into an opportunity for learning. Personal connections are formed between language and their ability to understand and manipulate the world around them. As they grow older they

are able to transfer this knowledge of language in to a very broad range of contexts and problems. This example reflects many principles of Constructivism: learning takes place in context; it is functional; it builds on knowledge previously learned; imitation and feedback play a key role; and the need and purpose for the learning are often stated. Constructivist theorists would name the practical, applied approach of this learning as the key to its dramatic success. We should not, for example, agree to a contract with our students which say that the only fair test is one with familiar and well-rehearsed problems.

5. Explicit Criteria

Frederiksen and Collins (1989) used the term *transparency* to express the idea that students must have a clear understanding of the criteria by which their work will be assessed. In fact, the features of excellent performance should be so transparent that students can learn to evaluate their own work in the same way that their teachers would.

6. Self-Assessment

Student self-assessment serves cognitive purposes, then, but it also promises to increase students' responsibility for their own learning and to make the relationship between teachers and students more collaborative. Constructivism gives learners ownership of what they learn, since learning is based on learners' questions and explorations, and students have a hand in designing assessment as well. Constructivist assessment engages the learners' initiatives and personal investments in their journals, research reports, physical models, and artistic representations. Engaging the creative instincts develops learners' abilities to express knowledge through variety of ways. For self assessment educational portfolio can also be used. An *educational portfolio* is a combination of a number of learning tasks and a compilation of the outcomes achieved as a result of the processes undergone therein. A critical component is the emphasis on 'process' over 'product' and the constant reflection of the learner as he moves from one stage to another in the realization of the objectives. The other significant feature is the acquisition of information from multiple sources and the necessary component of constant data analysis before proceeding to the following stages in the development of the portfolio. Assessment of learning outcomes also is a comprehensive one taking into account different areas of learner academic growth as a result of the processes being carried out from identification of goals to acquisition of relevant information and finally its processing and dissemination. Portfolio Assessment, focuses on growth and development over time, implemented through selection, reflection and inspection of class work, along with goal setting and self-evaluation.

7. Evaluation of Teaching

In addition to using assessment to monitor and promote individual students' learning, classroom assessment should also be used to examine and improve teaching practices.

This includes both ongoing, informal assessments of students' understandings to adjust lessons and teaching plans as well as more formal and critical action-research studies.

Technology-enhanced classrooms tap constructivist strategies , arranging problem-based projects where students actively construct knowledge, linking knew knowledge with previous knowledge. I experimented by introducing peer supported collaboration through technology in philosophy class. A group was created in google and all students and myself became members of the group. We used to post our entries reflecting on interactions in the class. It was very enriching experience as everybody used to engage in discussions and to my surprise even those who did not open up in the class. I could see everybody in the class got voice . It was very satisfying for me as well as for all students as I got to know from the feedback from them.

Conclusion

Constructivism is a learning theory whereby the teacher or educator uses the student's personal understanding and perceptions as the initial foundation on which to teach. Constructivism is both psychological, (Piagatian) and sociological (Vygotskian). Constructivists believe that assessment should be used as a tool to enhance both the student's learning and the teacher's understanding of the student's current understanding. Constructivism calls for the elimination of grades and standardized testing. Instead, assessment becomes part of the learning process so that students play a larger role in judging their own progress. A challenge in teacher education is to develop instructional practices that integrate theories of learning and instruction with practical pedagogical skills. Constructivist view on learning has important implications to both teaching and assessment. Taking a constructivist view of learning to explain interdisciplinary education may help teachers understand the process of building concepts and learning among students as well as the implementation of assessment tasks. Teachers need to have value for learning, inquiry, reflection, and community to practice constructivist assessment.

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