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RELATIONSHIP BETWEEN LEARNERS AND TECHNOLOGY WITH RESPECT TO CURRENT SCENARIO

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ABSTRACT

ICT offer a wide array of materials for building new schooling systems that allow long-distance exchange and interaction between geographically spread groups of teachers and their students. These materials are flexible and responsive to the changing needs of learners of all ages. Meeting this challenge, in turn, requires collaboration across national, cultural and institutional boundaries, and among individuals and groups who have been isolated. Electronic mail, bulletin board systems, teleconferences, and virtual communities on the World Wide Web (WWW) allow reciprocal communication among individuals and groups with common interests.

ICT should not be taught and learned independently from other subjects. Rather, ICT are a subject that, by its very nature, should be treated as interdisciplinary, integrative, and cross-curricular. The project-oriented method of teaching and learning, introduced through the use of ICT, will help both teachers and students become more conscious of their own capacities and responsibilities.

In view of this there is an urgent need of introducing ICT based Education to meet the challenges of globalization. The schools should be transformed from teaching institutions to learning organizations. Focus should be shifted from learning from technology to learning with technology. 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 program as well as the school system keeping in view the new pedagogy and challenges of globalization. Schools should be well equipped with the basic infrastructure of ICT. Teacher need to be convinced that his discipline contains an infinite number of possibilities for theoretical deepening and technical improvement. His understanding that he himself can make his work a meaningful one, play a vital role in implementing the educational framework integrating technology for the learners of 21st century.

KEYWORDS : Current scenario, ICT, Learners and Technology.

INTRODUCTION

Learning had undergone a paradigm shift. ICT are largely instrumental in shifting the emphasis in learning environments from teacher-centred to learner-centred; where teachers move from being the key source of information and transmitter of knowledge to becoming guides for student learning; and where the role of students changes from one of passively receiving information to being actively involved in their own learning.

Now the question come to our mind that how can ICT be used to enrich learning opportunities in our schools to meet the challenges of globalization? Global awareness is greatly encouraged by the progress of modern information and communication technologies. ICT offer a wide array of materials for building new schooling systems that allow long-distance exchange and interaction between geographically spread groups of teachers and their students. These materials are flexible and responsive to the changing needs of learners of all ages. Meeting this challenge, in turn, requires collaboration across national, cultural and institutional boundaries, and among individuals and groups who have been isolated. Electronic mail, bulletin board systems, teleconferences, and virtual communities on the World Wide Web (WWW) allow reciprocal communication among individuals and groups with common interests.

Our aims as educators must go beyond specialized training of craftsmen or factory workers. The only true education is one where all arts, crafts, sciences, and technologies are linked and facilitate mutual cognitive development, productive creativity, and personal growth. The new literacy, a term used more than a decade ago (Anderson 1993) to embrace the changed literacy demands resulting from the new technologies in schools, and ICT offer educators, perhaps for the first time, an opportunity to create such an ambitious scheme.

NEW LEARNING ACTIVITIES

Memorizing will not serve the purpose. Changes are needed in the status and functional role of teachers. Contemporary teachers do not have to pretend that they know everything in order to formulate problems and ways to solve them. At the same time, teachers have to play increasingly important roles of advisor and learning facilitator. The learners have to play the roles of responsible and active learner.

THREE RS FOR THE 21ST CENTURY

The traditional notion of literacy (including so-called numeracy) was based on the Three Rs: Reading, wRiting, and aRithmetic, together with accurate handwriting (preferably calligraphic), and memorizing certain excerpts from textbooks and classical poetry by heart.

The new literacy that is ICT-based and can be presented in three components corresponding to the traditional Three Rs:

- [Reading] – finding information by searching in written sources, observing, collecting, and recording;
- [Writing] – communicating in hypermedia involving all types of information and all media; and
- [Arithmetic] – designing objects and actions. (UNESCO, 2005)

The new literacy discourages memorization of facts and rules. It stresses the ability to find facts and imagine unprecedented options. A capacity to understand and invent rules, posing problems to oneself, planning and designing one's own activities, come to the forefront. The goal of this kind of education is not a narrow technical fluency, but personal development alongside the core competencies for high-level thinking and acting.

Modern society needs educated citizens who can make decisions and implement them in a rapidly changing world. Individuals, organizational structures such as corporations and governments, and educational institutions, should be prepared for life-long learning. Information processing and communication are becoming major activities in daily life, and effective citizens and leaders of the 21st century will be required to understand and fluently use the latest sophisticated tools to manage an enormous amount of data, information, and messages. Therefore, lifelong learning will be the normal state for a modern individual. One of the major changes in education can be described as a general shift from teaching to learning. The teacher's role is increasingly to assist students to become good learners. At the same time, teachers must help create stronger relationships between the subjects of study and concrete reality, putting them in a more relevant context for students. In many cases, this implies integration of disciplines and cooperation among teachers of different subject areas.

SCENARIO OF INDIAN SCHOOLS

Institutions like NCERT, CBSE, Board of Secondary Education and SCERT of different

states design the curricula, instructional methods, textbooks and other materials, which, after having a stamp of approval from ministries of education, are distributed to schools and teachers. A teacher's duty is to read and follow closely the body of these materials in order to deliver it piecemeal to students, who are expected to memorize the content one chunk after another, and checking in to see if they succeed. The basic, though rarely announced, assumption is that teachers need not add a word to what has been given from higher authorities. Teacher-to-student communication is predominantly oral. Visual aids are usually illustrations taken from books.

There is little hands-on activity with physical materials and tools on workbenches. The teacher is a lecturer, not a master of a craft. Little communication exists between teachers of different subjects on how to collaborate in making the educational process truly involving and effective. There is rigid timing; monologue lecturing and schools are considered as teaching institutions. The curriculum: a sum of disparate subjects. To become effective, school must transform itself into a learning organization

LEARNING ORGANIZATION

Peter Senge (1990) in his book *The Fifth Discipline: The Art and Practice of the Learning Organization* describes the learning organization as one in which "people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together." According to Senge, a learning organization depends upon five disciplines: personal mastery, mental models, shared vision, team learning, and systems thinking. These disciplines have been accepted as the corner stone of a new corporate culture and can be applied for initiating change process in any kind of organization. Through these disciplines, an educational institution will flatten its organization, develop models of collaboration for faculty and administrators, develop processes for evaluating and reviewing its goals, and involve all stakeholders in learning better how to perform their duties and responsibilities. It is quite possible for an educational institution to reduce its hierarchy, open the information flow, focus on whole systems, work together in teams, and develop flexible structures designed to enhance the continuing involvement of all stakeholders

THE BASE FOR NEW PEDAGOGICAL POSSIBILITIES

The time has come to incorporate innovative mental process and activities into the learning process. The traditional classes have been dominated by the spoken and printed word. The new classroom should practise a multisensory enhanced learning. Indeed, as long ago as 1920, Vygotsky's work (see Vygotsky, 1978) showed that a child's cognition and thinking, to a great extent, relied upon the manipulation of material objects used as tools as well as societal surrounding.

MULTIPLE INTELLIGENCES

In the 1980s, Howard Gardner formulated his theory of multiple intelligences (1983; 1993), in which he stated that people use one or more of at least seven (more recently eight and even nine) relatively autonomous, intellectual capacities to approach problems and create products. Gardner's seven intelligences are:

- Linguistic intelligence (as in a poet);
- Logical-mathematical intelligence (as in a scientist);
- Musical intelligence (as in a composer);
- Spatial intelligence (as in a sculptor or flight pilot);
- Bodily kinesthetic intelligence (as in an athlete or dancer);
- Interpersonal intelligence (as in a salesman or teacher);
- Intrapersonal intelligence (exhibited by individuals with accurate views of themselves).

What is important to the present discussion is Gardner's stress on the fact that a particular intelligence cannot be conceptualized independently of the particular context in which an individual happens to live, work and play, and the opportunities and values provided by that milieu. For example, Bobby Fisher might have had the potential to be a great chess player, but if he had lived in a culture without chess, that potential would never have been manifested.

MULTIPLE WAYS AND CONDITIONS OF LEARNING

Children have a natural interest and curiosity about the internal and external world, and an eagerness to communicate and to play, making collections and ordering items, creating unexpected and aesthetically significant objects. The basis for human development – habits and skills for lifelong learning – should be established in schools.

COLLABORATION OF SENSORY AND SYMBOLIC KNOWLEDGE

It is widely accepted today that it is not enough for students to understand and learn fragmented information. It is equally important for students to understand the context, meaning, and gestalt of topics as well. The objective, sterile environment in many schools actually inhibits learning. The traditional classroom must be replaced by rich, stimulating, accepting, warm, and responsive surroundings. "Both children and adults acquire knowledge from active participation in holistic, complex, meaningful environments organized around long term goals. Fractionated instruction maximizes forgetting, inattention, and passivity. Today's school programs could hardly have been better designed to prevent a child's natural learning system from operating." (Farnham-Diggory 1990)

As most teachers know, students labeled weak or slow often turn out to be bright and skilful when confronted with something that is personally appealing or challenging outside the classroom. Though these students have difficulty learning in school, they often excel at making, fixing and operating tangible things: gadgets, bicycles, motors, electrical circuits, complex mechanical devices, various kinds of contraptions and even imaginary objects. These children are usually identified as having trouble with the symbolic knowledge that forms the core of schooling. It is not surprising that the traditional school focuses on what weak students cannot do, and does not see them as possessing virtue of sensory knowledge in some fields. Instead, it sees them as failing to perform, or not meeting the requirements. An ideal teacher will appeal equally to symbolic and sensory smart students with a view to bringing these two kinds of knowledge into active and fruitful collaboration.

VISUAL COGNITION AND CREATIVE THINKING

Visualization of inner mental imagery and the outer graphic presentation of reality in pictures, drawings, diagrams, lists, and charts is a fundamental part of creativity, discovery, invention, and problem solving. The vital importance of visualization is affirmed by the fact that a surprisingly large proportion of the human cortex is devoted to vision and visual analysis, and that the bandwidth of the visual channel is greater than that of any other sense. In many instances, the eye, and those parts of the brain that process visual information, lay the

foundation for enhancing conscious thinking, which in turn, grows from our preconscious mental activity.

To take full advantage of the capabilities of the eye, the goal of visualization should be objectification. This means that a phenomenon, inherently visual or not, should be represented as having form, colour, texture, motion and other qualities of objects. Inductive thinking relies to a great extent upon the human ability to visualize on this preconscious level. Major portions of the visual system including the retina, the structures ascending to the visual cortex, and parts of the visual cortex itself fall into the preconscious category. More powerful than a supercomputer, these functional entities relentlessly perform information-processing miracles, creating a three-dimensional, coloured visual environment that our conscious self exploits in a logical way to serve definite practical purposes. Our conceptual images are constantly being analyzed at a preconscious level, and produce useful data for establishing spatial relations, making conscious representations and building plans. In other words, the outcomes of these subliminal mental activities become the elements, tools, and procedures of rational thinking. This is where computers make an enormous difference. When we visualize with the help of computers, video camcorders, and big-screen high-resolution projection, we restructure a problem situation so that more of it can be processed by the preconscious part of our brain – the visual system that is our silent partner. It is also possible to visualize on a computer screen the spatial interrelations of elementary predicates and, consequently, to represent complex formulas of predicate logic (Bederson and Shneiderman 2003; Card, MacKinlay, and Shneiderman 1999; Friedhoff and Benzon 1989; Rieber 1995).

As a kind of modelling, visualization has many aspects. One is aesthetic emotional. For example, nobody will deny that visualized mathematical objects and functions can be aesthetically beautiful. Animated cartoons shown on TV all over the world have already inspired works of fine art. Beyond any doubt, it is precisely because of their aesthetic components that such themes have become so popular in academic mathematical courses.

Another aspect of visualization-as-modeling is, as in the classical art of painting, selecting and making visible essential traits of the object or phenomenon depicted. Visualizing helps to impart a meaning to a problem and

makes it easier to find its solution. Using a similar learning environment under a teacher's guidance, the student can trace all levels of abstractions in modeling. For instance, there could be genuine physical objects and processes, material models, videotapes, computer simulations, graphical representations of processes' characteristics by co-ordinates and velocities within a set referential system, and symbolic modeling by algebraic and differential equations.

NEW PEDAGOGY

New pedagogy is based on the opposite of the traditional classical hierarchy. Behind the new theories, methodologies, and working approaches to learning, one can detect several underlying patterns, or fundamental principles and practices that seem perennial. These principles are referred to as poly-sensory, experiential, project-oriented, constructivist, and connectionist.

CONSTRUCTIVISM

Constructivism, a term introduced by Jean Piaget, asserts that the knowledge acquired by students should not be supplied by the teacher as a ready-made product. Children do best by creating for themselves the specific knowledge they need, rather than being instructed in what they must know. Seymour Papert later found that such things would happen especially felicitously when learners are engaged in constructing something external or at least shareable: a sand castle, a book, a machine, a computer program (Papert 1981). These kinds of activities lead to a model of learning that involves a cycle of internalization of what is outside, then externalization of what is inside, and so on.

CONNECTIVISM

The deliberate part of learning consists of making connections between mental entities that already exist; new mental entities seem to come into existence in more subtle ways that escape conscious (i.e. step-by-step) control ... This offers a strategy to facilitate learning by improving the connectivity in the learning environment, by actions on cultures rather than on individuals. (Papert 1993). Rather than passively receiving ready-made facts, notions and opinions, students acquire advanced skills and knowledge by solving problems in their immediate surroundings that they consider personally meaningful and emotionally exciting. The priority is not the transmission of particular knowledge and skills from teacher to taught, but the development of the ability to acquire these by

students on their own. All this, of course, is facilitated by new technologies of education.

LEARNING BY DESIGNING

Learning projects have to be found, discovered, invented, or designed in the course of a class. To benefit from this project method, both teacher and student must acquire some generic skills rarely taught in an ordinary school. This involves conceptualizing its problem situations, generating options, making choices, conducting mental experiments, finding acceptable solutions, and evaluating probable outcomes before actually implementing them. From this standpoint, design can be seen as an innovative intellectual technology waiting to be converted into a powerful technology of education. True teachers do something more than just transfer information. In receiving any source-material, teachers make it a part of themselves by re-exploring, re-interpreting, and re-constructing its form and content in a personal way. Examining the phenomenon of inner speech, Vygotsky (1986) pointed out that a child, assimilating a certain notion, re-works it, and during the process of re-working, expresses the peculiar features of his own thought.

TEACHING STUDENTS TO BE GOOD LEARNERS

To teach students to become good learners is the slogan of 21st century. A good learner is someone who is always alert, attentive, perceptive, responsive, and ready to be proactive in grasping, digesting or assimilating a knowledge, skill or competence. This is true from kindergarten, elementary, middle school and high school, through years in college or university, and in all walks of adult life.

The strategy to make a good learner out of every student in a class is presented below

- Teacher may identify at least two or three (better five to seven) colleagues in his/her own or other schools, who are willing to collaborate either close by or far off (e.g. via email exchange) to develop a project.
- Teacher may show students a variety of optional activities from which each is asked to choose a few that are challenging, alluring, and suitable to them personally.
- Teacher may provide a friendly environment, materials, and tools with which students can tinker freely, if only by imitating by example.

- Teacher may encourage students by means of informal conversation and discussion to exercise playfully their explorative curiosity, adroitness, and inventiveness, coupled with developing an awareness of what they are doing in the broader cultural-educational context.
- Teacher may encourage students by means of informal conversation and discussion to exercise playfully their explorative curiosity, adroitness, and inventiveness.
- Teacher may introduce some simple and attractive structured games with strict, explicitly defined rules relevant to the topic under study, and invite the students to play to win.
- Teacher may make students aware that their success in playing these goal-oriented games depends upon their willingness, and acquired ability to observe conventional rules they have accepted by mutual agreement.
- Teacher may devise a series of more complicated, project-oriented games that are related to the consequent themes, topics, and tasks in various subject matters and implying a collaborative rather than competitive approach to problem solving. Students, in their turn, will become more and more involved in mutually supporting, intellectually and emotionally rewarding teamwork for exploration, research, designing, testing and implementing their discoveries, inventions, and solutions, while seeing the teacher as a partner in real business and a competent master of the craft.

TEACHERS AS MASTER-LEARNERS

School teachers must revise their positions, leaving behind the status of the omniscient one who has all the answers. Instead, genuine teachers will become advisers and learning facilitators in prompting students to learn how to do it by their own minds and hands. As a matter of fact, the authority of teachers can be re-established on the basis that they possess three interconnected kinds of mastery:

- Mastery of Doing – one can do a lot, but not everything, and can do more in cooperation with others.

- Mastery of Learning – one is not the only source of information but can teach how to find alternative sources.
- Mastery of Collaboration – one can multiply results by joint work with students and other teachers.(UNESCO, 2005)

INTEGRATING ICT INTO CURRICULUM

ICT should not be taught and learned independently from other subjects. Rather, ICT are a subject that, by its very nature, should be treated as interdisciplinary, integrative, and cross-curricular. The project-oriented method of teaching and learning, introduced through the use of ICT, will help both teachers and students become more conscious of their own capacities and responsibilities. Of course, some elements of ICT can be taught in a dedicated time. However, it is important to support learning by an immediate application of technology that is meaningful and relevant to students.

MAIN ADVANTAGES OF ICT

In creating this new teaching learning environment, ICT offer numerous advantages and provide opportunities for:

- facilitating learning for children who have different learning styles and abilities, including slow learners, the socially disadvantaged, the mentally and physically handicapped, the talented, and those living in remote rural areas;
- making learning more effective, involving more senses in a multimedia context and more connections in a hypermedia context; and
- providing a broader international context for approaching problems as well as being more sensitive response to local needs.

It is believed that ICT enable teachers and students to construct rich multi-sensory, interactive environments with almost unlimited teaching and learning potential. From the learning-teaching perspective, ICT should:

- provide access to online resources that use a powerful combination of video, text and graphics, prepared by specialists in a centralized facility and delivered to individuals or groups by technology;

- make provision for the teacher to teach a whole class or part of a class, assisted by technology as appropriate;
- make provision for all students to learn the same way or to choose ways that suit their individual learning styles, assisted by technology as appropriate;
- provide access to individualized curriculum pathways, managed by technology;
- provide access to individualized diagnostic testing and assessment of progress, managed by technology;
- allow students to move independently between learning areas as necessary, managed by technology;
- provide large screen video display (projector);
- make individualized access to network resources including wireless networking; and
- provide continuity of access to network resources away from school.

CONCLUSION

In view of this there is an urgent need of introducing ICT based Education to meet the challenges of globalization. The schools should be transformed from teaching institutions to learning organizations. Focus should be shifted from learning from technology to learning with technology. 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. Schools should be well equipped with the basic infrastructure of ICT. Teacher need to be convinced that his discipline contains an infinite number of possibilities for theoretical deepening and technical improvement. His understanding that he himself can make his work a meaningful one, play a vital role in implementing the educational framework integrating technology for the learners of 21st century.

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