

## **ROLE OF INFORMATION TECHNOLOGIES IN TEACHING LEARNING PROCESS: Perception of the Faculty**

**Assistant Professor  
Dr. Irshad HUSSAIN  
Department of Education  
International Islamic University Islamabad  
PAKISTAN**

**Muhammad SAFDAR  
Department of Education  
International Islamic University Islamabad  
PAKISTAN**

### **ABSTRACT**

Information technologies have affected every aspect of human activity and have a potential role to play in the field of education and training, specially, in distance education to transform it into an innovative form of experience. The need of new technologies in teaching learning process grows stronger and faster. The information age becomes an era of knowledge providing sound and unmatched feasibility for discovery, exchange of information, communication and exploration to strengthen the teaching learning process.

Information technologies help in promoting opportunities of knowledge sharing throughout the world. These can help the teachers and students having up-to-date information and knowledge. Accurate and right information is necessary for effective teaching and learning; and information technologies (Haag, 1998; p.10) are "set of tools that can help provide the right people with the right information at the right time." Students are independent and they can make best decisions possible about their studies, learning time, place and resources.

Students are able to work in collaborative and interactive learning environments effectively communicating, sharing information and exchanging ideas and learning experiences with all in the environment.

**Keywords:** Information technologies; teaching learning process; computers; knowledge explosion; media; distance education.

### **INTRODUCTION**

One of the basic functions of education is preparation of students for life. This function in 21<sup>st</sup> century may be participation in an information rich society, where knowledge is regarded as the main source for socio-cultural and politico-economical development of countries and/or nations. Information rich societies are developed and dominating and they are controlling the information throughout the world. Information encompasses and relies on the use of different channels of communication, presently called information and communication technologies (Hussain, 2005) and would be incorporating better pedagogical methods to cope with such emerging situations.

These have changed the scenario of education particularly, pedagogy and instruction making teaching learning process more productive creating collaborative, learner centered and interactive global learning environments. Therefore, information technologies are assumed to play a constructive role in education to make the teaching and learning process more productive through collaboration in an information rich society.

Information rich society promotes new practices and paradigms for education where the teacher has to play new role of mentoring, coaching and helping students in their studies rather to play the conventional role of spoon feeding in the classrooms. Students can learn independently having a wide choice of programme selection and access to information. Students can be involved in skill oriented activities in group learning environments for accumulated knowledge. They can interact and share learning experiences with their teachers and fellow learners in knowledge construction and dissemination process. They can receive and use information of all kinds in more constructive and productive profession rather depending upon the teacher.

Branson (1991) stated that students learn not only by the teacher but they also learn along with the teacher and by interacting with one another. Indeed, now students can learn much more than that the teacher teaches in conventional learning environments. For productive teaching learning process teachers and students have to use information technologies according to their requirements and availability.

## **INFORMATION TECHNOLOGIES**

The history of information storage and dissemination indicates that human being used different things for information storage, its display and transmission. In different ages people used different materials and methods for communication such as rocks and stones, papyrus, palm leaves, animal leather and handcrafted manuscripts for storing and transmitting the information from one place to another and to the next generation. These means of information were limited and confined to the elites but "the advent of printing enabled information to be truly widespread throughout the world to move to a more equitable level in terms of access to knowledge" (Menon, B., 2000, p.xi).

At present, knowledge may be regarded as power and it comes from having information. Information encompasses and relies upon the use of different communication channels or technologies –called information technologies, for its effectiveness and equal access. Information technologies may extend knowledge beyond the geographical boundaries of a state or country providing relevant information to the relevant people round the clock.

Information Technology "is any computer-based tool that people use to work with information and support the information and information processing needs of an organization" (Haag, 1998; pp.17. 518). It includes computers and its related technologies; WWW, Internet and Videoconferencing etc. Information technology can be used to promote the opportunities of knowledge dissemination. It can help the teachers and students having up-to-date information and knowledge.

Accurate and right information is necessary for effective teaching and learning; and information technology (Haag, 1998; p.10) is a "set of tools that can help provide the right people with the right information at the right time."

In this sense, information technologies may be the result of knowledge explosion, where according to Marriam, and Cafarella, (1997, p.15) "computer technology (software) extends the mental ability." Therefore, information technologies may include computer and its related technologies of high tech and low touch nature. Chapp, (1994) called them emerging technologies and stated that these are the products coming out of laboratory and into the hands of educational community.

These include wireless communications, the information highway, asynchronous mode, integrated services digital networks (ISDN), multimedia applications, personal digital assistants, artificial intelligence and virtual reality. These technologies would be big of brain and small of mass, depending upon computer technology for their effectiveness and increased capabilities. Similarly, Rashid, M. (2001) discussed the interactive video, CD-ROM, compact video disc, Internet, WWW, teleconferencing, computers, satellites and e-mail as emerging information technologies, and according to him these are "current technologies incorporating into the teaching learning environment [process]" (pp.301-338).

### **INFORMATION TECHNOLOGIES AND TEACHING LEARNING PROCESS: Making Students Independent in their Studies**

Using information technologies students can decide about their studies, learning time, place and resources in a better way. Students can work in more supportive environments, seek help from teachers and fellows, and share their learning experiences and ideas in romantic and productive fashion.

Dede (1996, p.4) stated that the development of high performance computing and communication is creating new media such as the Www and virtual realities. In turn these new media enable new type of messages and experiences, such as interpersonal interactions in immersive synthetic environments lead to the formation of virtual communities. The innovative kinds of pedagogy empowered by these emerging media and experiences promoted the opportunities of distance education and at present virtual education and eliminated the barriers of distance and time. New and innovative learning experiences would be enhanced and encouraged by these technologies, as by virtual communities, which exist by interactions across the globe through global network of computers round the clock. The global sharing of experiences would make possible the group presentation form of instruction in distance education. Distance education encompasses and relies on the use of information technologies to make learning more productive and more individualized, to give instruction a more scientific base and make it appropriate & more effective, learning more immediate and access to resources more equal. These remarkable aspects can expand the quality and quantity of instructional resources. They can serve learners at their ease in terms of time and place. Rashid (2001, p.270) stated that:

- Both teachers and learners can work with others at remote sites.
- The community of learners can expand to include virtually anyone who wishes to obtain information and who is not excluded by policy or cost.
- They can provide real access to experts in universities, research laboratories, the business community, government agencies and political offices.

Information technologies can promote the opportunities of restructuring the teaching<sup>48</sup> learning process.

These can transform teaching and learning by offering alternatives to the teacher provided information, access to virtually unlimited resources and opportunities for real world communication, collaboration and competition. The phases of this process as described by Marriam et al (1997, p.34) are,

- " developing awareness – recognizing that something is wrong or different;
- exploring alternative—researching for new ideas from other institutions and acknowledging that change is needed;
- making a transition—leaving the old approaches behind (or dramatically changed);
- achieving integration-putting the pieces from the transition phase back together; and
- taking action-putting new ideas into operation".

The process can work at instructional programme or institutional level and one or more phases work simultaneously. Traditional lectures and demonstrations can become web-based multimedia learning experiences for distance learners. Web can enrich the learning resources and institutions refocus from teaching to learning, from teacher to learner. It can create learning environment throughout the world by networked learning communities. Networks may create educative environments embedded in democratic philosophy of instruction and helping learners learn. The characteristics of which are:

- "respect for personality;
- participation in decision-making;
- freedom of expression and availability of information; and
- mutuality of responsibility in defining goals, planning and conducting activities and evaluating [the process]" (Knowles 1980, p.85).

Learning may take place more effectively and dynamically in educative environments where teacher and learners are open to each other to interact and exchange information and experiences in a friendly way. Ennis (1989) concluded in a study "Openness on the part of instructor increased their [learner's] desire to discuss problems or topics of interest... these discussions expanded their [learner's] understanding of the content and assisted them in planning the information within a relevant context in their own lives". Educative environments can enhance and shape the teaching learning process to achieve the desired goals. There is a natural tendency for students to learn and learning can accelerate, in interactive and encouraging environments. Accelerating the encouraging environments may be psychological climates and students' interactions can create them. Interactions of students can make learning environment more effective and meaningful and 'much of learning takes place in a meaningful environment'. Learners may get immediate feedback and reinforcement through web-based learning.

The psychological fashion of such reinforcement and expectancy also influences the potential for any given behaviour and/or learning to occur. Desired learning always requires access to qualitative and latest information resources and web confirms the increased access to such resources at students' pace. Moreover, Aggarwal (2000, p.11) says "there is no denying that web-based courses open new educational access to the non-traditional and geographically dispersed students. The on-line setting provides a<sup>49</sup> level of flexibility and convenience not provided by traditional classroom courses".

Internet and WWW provide learners latest relevant information at their own pace and they can form a virtual community of learners at global level. Teaching organizations are adopting information and communication technologies specially the computers, World Wide Web, teleconferencing and educational television because of their cost effectiveness, access and flexibilities of choices.

**Students Use Information Technologies to:**

1. Participate in a media revolution, profoundly affecting the way they think about and use information technologies.
2. Improve the ways of learning in new learning fashions
3. Extend the ability and skills of applying their learning in real situation.
4. Working in groups for cooperative and collaborative learning
5. Developing self-learning habits at their own pace and time.
6. Learn with the teacher rather by the teacher.
7. Develop inquiry-learning habits.
8. Use right information at right time to achieve right objective.
9. Review and explore qualitative data.
10. Exchange learning experiences and information with others students and teachers living anywhere in the world.

Information technologies facilitate students in their learning process through their active participation on one hand and help teachers on the other hand. Therefore,

**Teachers Use The Information Technologies to:**

1. Present the material in more interesting and attractive way.
2. Guide and help students in searching the qualitative material.
3. Make best use of time.
4. Coach the students.
5. Provide individualized instruction.
6. Direct the students toward cooperative as well as collaborative learning activities.
7. Prepare learning material for students, rather teaching in conventional situations.
8. Diagnose the learning problem of students and help them to overcome.
9. Solve the study problems of students.

Information technologies affect the teaching learning process in different ways. These helps the teachers in preparing lecture notes for interesting presentation, on the one hand and facilitates the students on the other hand. Different technologies help the teachers and students according to their respective nature and capabilities of storage and presentation. For example computers are used in education for various purposes as they can store and retrieve a huge amount of information. All 20 volumes of the Oxford English Dictionary are contained on one compact disc. The disc provides instant access to 616,500 words and terms, 137,000 pronunciations, 2.4 million illustrative quotations, 577,000 cross references, and 249,000 etymologies. Similarly, American Memory includes Library of Congress collections of primary materials from American history. Available on a combination of computer audio and videodiscs, American Memory contains 25,500 photographs (dated form 1800 to 1920); 500 prints and cartoons about Congress; 60 sound recordings (pre-radio) of early 20<sup>th</sup> century leaders; 1,610 color photographs taken during World War 2<sup>nd</sup>, 28 motion pictures of President William McKinley and 350 pamphlets by blank authors from Reconstruction to the<sup>50</sup> First World War (Menges, 1994; pp 184-185).

Information technologies provide the opportunities of global interactions. Students can learn from interactions with the information, interface, teachers and co-learners using global networks. They can interact at their own and get rid of their routine work. They may review and explore the qualitative as well as quantitative data through computer networks. They can work on group projects participating in peer learning and knowledge building activities. Under the influence of information technologies, teaching and learning occurs in a changed situation. There seems a shift from teacher centered teaching to student centered learning. Menges (1994) stated that the eight "shifts" of Collins (1991) reflect the effects of information technologies on teaching and learning process. These shifts put greater emphasis on the activity of the students than on that of the teacher's. These include:

#### **A shift from lecture and recitation to coaching**

Students learn by interactive technologies and teacher facilitates them on how to use and reflect responses. He/she may be diagnosing learning problems and helping learners to find their solutions. When students work with information technologies, teachers reduce the time they spend directing students; they spend more of their time facilitating student learning.

#### **A shift from whole-class instruction to small group instruction**

Students progress at different rates and pace in their learning process. Teachers can interact with individual students and in small groups. They can become better informed of the individual student's progress and problems in their learning. So they can help and facilitate students individually in more effective way.

#### **A shift from working with better students to working with weaker students**

Individual differences exist among students at all levels of learning. Information technologies enable teacher to cope with this problem in large classes working with individual students and in small groups. The teacher is then able to aim instruction at one specific target group and to devote time to those who mostly need help.

#### **A shift from all students learning the same things to different students learning different things**

Conventionally, all students had to learn the same things what the teacher intended to teach them in a class. However, now the situation has changed and the use of information technologies has enabled the students to learn what they need, and what they want to learn.

There also exists individuality in some common attainments. Resources for learning are available through information technologies, it becomes possible for students to recognize and use the appropriate information to achieve the goals under the tutelage of teacher.

#### **A shift towards more engaged students**

Conventionally, majority of students is passive listener in the classrooms for most of the time. Teachers carry on delivering lectures without any concern of students' participation in the teaching learning process. Use of Information technologies in classroom situation particularly interactive technologies however; ensure attention and active involvement of students.

Well-designed computer-mediated instruction is more likely to engage individuals for<sup>51</sup> effective learning than simple lectures and book reading a classroom.

### **A shift from assessment based on test performance to assessment based on products and progress**

Competencies and skills are necessities to live a successful and productive life. These may result from undertaking creative projects rather than repeating or paraphrasing information from lectures and textbooks. The best projects include realistic tasks that generalize the student's learning and its application in new situations. Information technologies actively involve the students in different competency based activities through skill oriented projects in real situations.

### **A shift from competitive to a cooperative goal structure**

Collaborative and cooperative learning approach provides learners the opportunities of extensive interaction. Students have access to extensive databases and share their own work through networked communications to work on collaborative projects. Teachers guide the students on how to share and interact in networked collaborative learning environments.

### **A shift from the primacy of verbal thinking to the integration of visual and verbal thinking.**

Using information technologies students would have extensive experience with video than with print, yet instruction is based primarily on print. However, visual literacy is poorly understood and poorly utilized in perceiving instruction. Teachers need to consider what capacities for visual knowledge and skills students should possess, and determine how they can ensure progress towards developing these capacities.

Information technology can help the teacher on the one hand and facilitates the learners on the other hand. Both, teachers and students get rid of their routine work, and have to play their new roles in new situations respectively. Teachers spend much of their time in assisting the students rather lecturing; and students access the information of their need.

## **NEW SITUATIONS-NEW DEMANDS**

In the age of information technology, effective and efficient learning is potentially possible at all levels for all round the clock. Content-centered presentation by teachers to large groups of students can not have any justification to be dominant method of instruction.

In the era of information technology teachers will be spending more time in facilitating students rather delivering lectures in the classrooms. They would be working in groups; preparing and evaluating instructional materials and organizing data into meaningful information and accessible forms. They will be spending their time in coaching students; helping them to learn through reviewing the huge information. They will be offering group presentations.

Presentations will not be used to provide new information instead, presentation will be carefully constructed to model and answer existing questions and solve current problems in certain disciplines. They will also be demonstrating the potential of skill development in students by using information in problematic situations.

Menges (1994. pp 188-190) considers the changed role of teachers of great importance. The following shifts reflect the new role of teachers in new situations. 52

### **A Shift From Covering Material To Assisting Students In Sampling Material**

Teachers decide what is essential and what is optional for students when the information is too much to decide by students. The essential information can be assigned and students guided to work in an effective way. The content should span a variety of media to ensure that students become adept in using information sources and that they experience the effects of diverse media.

### **A Shift From Unilaterally Declaring What Is Worth Knowing O Negotiating Criteria That Identify What Is Important**

Instead of providing net packages of content, the teacher plunges into primary sources with students. Together they develop ways to discriminate the more important from the less important. Courses' exercises can help to develop criteria about the importance of information and its use for specific purposes. Students can discuss these criteria for understanding and developing the new one if needed. A discipline-specific criterion validates the information and enables students to develop expertise in formulating criteria in other disciplines. They must also medium specific as the characteristics of print and electronic information significantly differ from each other.

### **A Shift From Ranking Students Relative to One Another to Negotiating Standards Specific to Individuals**

Information technologies promote diverse academic opportunities and paths for each student. Students show progress according to their capabilities and some students may progress slowly than others. The teacher can not use uniform standards of achievement and uniform rate of learning to evaluate students' work. Therefore, it would be necessary to negotiate learning objectives and rates of progress that reflect individual interests, abilities, skills and needs.

### **A Shift From Grading According To Individual Attainments To Grading According To Collaborative Contributions**

Evaluation of individual work is easy. But judging and rewarding individuals' work in group performance is difficult because roles and responsibilities of each group member vary. Information technologies permit almost variability in the tasks that group members pursue.

### **A Shift From Merely Verifying Student Source To Deriving Standards for Fair Use and Credit**

Plagiarism is a curse in academic affairs. For a teacher it is too difficult to verify all the sources to ensure the originality of students' work.

This role of plagiarism detector seems impractical when sources are so numerous and information can be so easily altered. But the computer software has made it possible to detect the plagiarism.

### **A Shift From Requiring Students To Produce Knowledge To Rewarding Them for Demonstrating Originality**

A student should have the skills and capabilities of understanding and applying knowledge in real situations. Without the application of knowledge students can no longer retain it and soon they forget. In the era of information technologies students should be able to apply core concepts and generalize principles to significantly different situations. Exposure to information technologies leads to this affective principle.



Information technologies would develop in students, the ability of judging the validity and precision of information. Learning by information technologies, students would analyze and explore the information to achieve certain objectives of their study.

### **PREPARATION FOR THE AGE OF INFORMATION TECHNOLOGY**

Certain skills capabilities of using different information technologies are necessary for students as well as teachers. Therefore, gradual encounters with the technologies are necessary to prepare themselves for the age of information technology. They will anticipate in the age of information technology as:

- **Requiring students to use electronic databases in their searches.**
- **Encouraging students to use electronic mail to ask questions, and for submitting assignments.**
- **Becoming familiar with the advantages and disadvantages of the technologies and exploring the capabilities of compact-disc read-only memory (CD-ROM), tele/videoconferencing etc.**
- **Surveying students about their familiarity with the information technologies and asking if they will share their knowledge and skills with the class.**
- **Using a word processor to develop class notes and editing a version to use as students' handouts and a version for overhead transparencies.**
- **Using computer programs for keeping records in large class-enrollment lists, test items and so on and having students review and update their own record from time to time.**
- **Using different packages for data analysis**
- **Encouraging students to include visual elements as part of their projects.**
- **Spending students' time as a multimedia workstation, planning a presentation; assembling projection graphics, video clips, animation, sound and other materials; trying to match particular materials with specific learning objectives; and integrating the materials into a unified presentation.**
- **Eliminating and/ or minimizing physical problems arising from the use of information technologies.**

### **CONCLUSION**

Information technologies are the result of knowledge explosion. These include hardware & software technologies and facilitate teaching learning process. Using Information Technologies learners are now able to participate in learning communities throughout the world. They are independent and free in choice of their programmes of study and access to the resources. They may learn collaboratively, share information, exchange their learning experiences and work through cooperative activities in virtual learning communities. Information technologies facilitate teaching learning process in more productive fashion. Similarly, the role of teacher is also different in new settings than in the conventional system. Teacher facilitates and guides the learners in their study playing the role of a coach or mentor. Now teacher is not at the center of the instruction and sole source of information as in conventional classrooms. He/she decides contents/experiences and/or activities, locates the resources and guides learners how to have access and utilize the information for required outcomes. In<sup>54</sup> nutshell, information technologies are restructuring teaching learning process to meet the International standards.

## BIODATA and CONTACT ADDRESSES of AUTHORS



**Dr. Irshad HUSSAIN** is currently working as Assistant Professor in the Department of Education, International Islamic University Islamabad, Pakistan. He did M.Phil and Ph.D in Distance & Non-formal Education from Allama Iqbal Open University Islamabad, Pakistan. His research area at Ph.D level was to study the impact of emerging technologies on teaching learning process with reference to distance education. The main areas of his interest are Teacher Education, Distance Education, Adult and Continuing Education, Emerging Technologies, Professional Development and Teacher Training Programmes through Distance Education.

He has worked in impact studies for ADB, GTZ, UNESCO and NCHD in the area of Adult Education, Literacy and Primary Education.

He is sub editor of **Asian Journal of Distance Education** (online) and member of review panel of i-managers' Journal on School Educational Technology (India). He is member of International Reading Association (IRA) USA, Pakistan Reading Association (PRA) Pakistan and Allama Iqbal Open University (AIU) Islamabad (Member Course Team & Tutor and Research Supervisor at Master & M. Phil level).

### **Dr. Irshad HUSSAIN**

Assistant Professor,  
Department of Education,  
International Islamic University Islamabad, PAKISTAN  
Cell # 0092 300 680 5998

Emails: [irshad\\_iub@yahoo.com](mailto:irshad_iub@yahoo.com) or [irshad\\_iub@hotmail.com](mailto:irshad_iub@hotmail.com)



**Muhammad SAFDAR** is a Ph. D Scholar at the Department of Education, International Islamic University Islamabad, Pakistan.

He did M.Phil in education from Allama Iqbal Open University Islamabad. His areas of interest are guidance and counselling , curriculum development and information technology.

### **Muhammad Safdar**

Cell # 0092 306 679 9816

Emails: [safdargul2004@yahoo.com](mailto:safdargul2004@yahoo.com)

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