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8th AMIC ANNUAL CONFERENCE

Title: "Using Information Technology In Education In The New Millenium: Opportunities And Threats"

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Topic: "Learning Technologies: Transmitting Or Transforming Education"

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**ABSTRACT:**
The dawn of the new century is accompanied by a number of challenges for the humanity and for the developing countries as well. The world of opportunities thrown open by the advantages of Information Technology is one of these challenges. No doubt, Information Technology is the most potent tool of imparting education and to make it reach to the masses. The developed countries have already made great inroads in this area. This progress and that to at an exponential rate of development is being viewed as a big threat by many in the developing countries. These developing countries thus have started frenetic efforts to embark upon the IT highway. But the threat that is posed by such an action is that of greater harm than good. Just before the IT revolution all the developing an education system for themselves which can produce the citizens of tomorrow. They were much concerned about the quality of education and the viability of the model of education they had been following. The efforts towards revamping of the education system got defocused on account of incoming of IT. All of them now started thinking seriously about maximizing the usage of IT to impart education. This unmindful rush is the concern of the authors of this paper. The authors feel that before embarking upon the IT highway, the developing countries should first decide to redesign the educational model so as to suit the needs of tomorrow. Use of IT in the existing education system would merely be a patchwork and wastage of resources. The old system that is already in smithereens shall not be able to tolerate the sophistication of IT. Also, the inherent lacunae of the education system shall not be removed by the advantages that IT shall provide. Hence, the authors propose that first radical changes must be brought about in the already existing education system and then IT should be used to impart education.

**1.00 INTRODUCTION**
The subject of this session ‘Learning technologies: Transmitting or Transforming Education’ is one of the most significant concerns that must be addressed to by almost all the developing countries before embarking upon technology highway in education. This seminar at the very doorstep of the
21 century, is extremely significant as most of the developing countries are also at the doorstep of adopting the technology in the education sector. The unique problems in education need unique solutions. Any unmindful mad rush to adopt technology without considering its implications shall not only make a huge sum go down the drain but shall also pose several problems in the years to come. Hence proper precaution must be taken before adopting this immensely potent tool. It must be kept in mind that learning technologies is not an end itself, but one of the means to a greater end. Its adoption after a threadbare analysis of its pros and cons, its viability and feasibility to a particular developing country and the education system prevailing in that country, shall only ensure that its delivers the goods. In the light of this concern we have every reason to feel that this seminar with its various elements could not have come at a better time. It provides us a great opportunity to sit back and contemplate, rather than blindly follow something just because others have been able to reap great benefits out of it. Before initiating any discussion on the topic it is imperative for us to analyze its elements. Learning technologies is a generic term which can be used for the various technological levels that are employed to impart education to a larger mass in a more efficient and effective manner. Earlier radio, TV, films, documentaries and gadgets like OHPs, VCRs, projectors etc. were carrying out this role, although in a very limited and techno-centric way but with the advent of IT the scene has changed dramatically. IT due to its inherently large potential and capacity of a wider reach not only has proved to be a sea of information but has also proved its potential as a parallel medium of instruction. IT has occupied the stage of education in such a big way that it has left all other technologies far behind and in fact has become synonymous to distance education. It has exposed the extreme limited potential and cumbersome modus- operandi of the other technologies. No doubt the other technologies have also been effective in their own way but IT incorporates in it all the advantages of all these other technologies and also offers much more.

Interestingly the social revolution brought about by IT which has made us stream line and reengineer all our process by questioning the
relevance of each action also prompts us to question the very basis of the
premise of the usefulness of IT in imparting education.

As far as the developing countries are concerned the decision to adopt
IT for imparting education has to be taken in light of two concerns. Firstly
the model of education that one is following and secondly the exponentially
rate of growth. These two concerns clubbed into one constitute the other part
of the topic that is – Transmitting or Transforming education.

The models of education being followed by most of the developing
countries are under severe criticism as they have been unable to groom the
human resource of these countries in the way it was sought. Frenetic efforts
are on in all these countries to design an education system that can address to
the needs of today and tomorrow. Furthermore the challenge that the 21
century threatens to pass on account of the bewildering change associated
with it challenges the educationalists to devise a model of education that not
only produces individuals who posses human values, conceptual clarity,
professional skills and creativity but also have the flexibility and foresight to
take on the challenges of change.

In this context the concern is to transform the education rather than to
transmit it efficiently and effectively. Had these education models being
successful the question would only have been of transmitting and here IT
would have won hands down. But on account of the limitations of the
prevalent education models usage of IT must be done with a pinch of salt.

2.00 EDUCATION: IT’S MEANING, OBJECTIVE AND CHANGING
ROLE

Education, one of the most hotly debated subjects of our time has been
defined in several ways by different thinkers and schools of thought in terms
of its nature and objective. One of the views submits that education is a
process of converting information into knowledge and knowledge into
insight. The Cambridge Dictionary of English defines it as ‘A formal process
of teaching something or of training in a particular discipline’. By
introducing the word formal, this definition limits its scope to the formal
systems of learning and teaching and hence does not cover the vast span of
education that continues throughout one’s lifetime. We, in this discussion
shall also view education in this light only. Encyclopedia Britannica giving a
comprehensive definition of education defines it as ‘All those experiences that effect the growth and development of a person throughout life’. Plato envisions a society with a hierarchy based on the level of education and advocates step by step filtering of people at different levels of education as per their levels of intelligence. Saint Thomas Aquinas has proposed a model of an educated man, that views him as scholastic and rational and whose intelligence has been vigorously disciplined in the pursuit of moral intelligence. Locke supports the education that develops both the physical and the mental faculties of an individual. Whatever might be the definition but there is almost unanimity as far as the objective of education are concerned and they are:

a) that education should serve the needs of the individual, and

b) that education should serve the needs of the society.

The 21st century presents unique challenges for education system for which higher education must be prepared to embrace them. Today our local community is the world community and our lives are touched by people from all over the world which tends to create opportunities for new learning and new challenges for our education system. In the coming years higher education will continue to diversify. Obviously there will be important role of IT tools in education, but some of the curricula foci may change. The fashion for management and computing courses will likely peak and we may see a resurgence of older subjects in an interdisciplinary guise. Besides that the transition to the Information Age presents an unparalleled opportunity in the way that we can and ultimately will deliver education. Higher education will soon be a global market. The race is on, and the outcome is going to change not just higher education, but people around the globe. This is a chance not only to export knowledge, but to lift societies.

Meanwhile non-traditional education has evolved from correspondence courses, to video based classes taught in a remote location, to online Internet classes which do not meet at a specific time. Different models of distance learning share the common feature of a remote place and are further distinguished by pace (scheduling), time (synchronicity) and interactivity. For example courses may be offered as open enrollment, with the student determining the time frame within which to complete the program, or as paced (also known as cohort), where a group begins and ends the program at the same time on an academic calendar.
3.00 INFORMATION TECHNOLOGY:

3.1 Potential, Myths and Status

Information technology, as the world is most frequently used in the form its acronym IT, is one of the most influential tools in restructuring the education system right from the era of ‘Gurukuls’ to that of present day virtual classrooms. Earlier, the IT tools were nothing but lectures, discussions and few scriptures or text materials, but today the nature of IT has changed dramatically encompassing tools like internet, world-wide-web, video-conferencing, virtual education systems, satellite communication system and the list goes on. Having the characteristic properties of group studies, combined learning, and generalized focus of the staff or the faculty members, today’s education system with the whole gamut of IT tools has changed to a personalized, tailor-made and ‘customer-centered’ system. It’s a general perception and a common belief in the west, as the most frequent and extensive users of IT tools in the education system, that the advent and use of IT tools has not only provided a specialized face-to-face interactive communication mode, but has also made the education widely accessible and cheap. By the use of videos and documentaries as the potential IT tools, the education has now become all pervasive and any student irrespective of space and time constraints can be a part of this modern education system, at any time and form any part of the world, provided he/she is aware of the potential capabilities of the various IT tools. Now this clause or the assumption makes it imperative of all of us to focus on a topic of the potential capabilities of the IT tools.

Information technology on account of its connectivity, user-friendliness, and easy accessibility offers a variety of advantages and opportunities in its role as a medium of instruction. Levers like internet, e-mail, voice-mail etc appear to be reservoirs of limitless potential. The IT revolution has given rise to phenomenon which would were beyond the imagination of human mind till now. This revolution is changing the way we live, think and work. Moreover in this era of transformation when everything in the society is changing (education also cannot remain uninfluenced) moreover it has to change and change in a big way in-order to be able to
produce the techno-savvy generation capable of surviving in these turbulent times.

But the picture is not all that rosy. The euphoria generated by the benefits of IT has been so great that everybody has joined the bandwagon, unmindful of the implications it shall have in the future. No doubt IT has limitless energy but then this energy is something like nuclear energy which is beneficial only when it is controlled and channeled without which it becomes a tool to inflict disaster. Also in over enthusiasm we must not forget that IT is merely a tool and not an end itself. We can confuse between the two only at the cost of our survival. Hence, the sooner a developing country comes to term with this fact the better or else it shall prove to be the second Himalayan blunder after the unplanned industrialization.

Taking into account the resource scarcity in economic, technological and moreover in financial terms, developing nations can’t in anyway, afford to neglect the cost associated with the large investments required to be made in the implementation of IT tools in the education system. Since, the financial necessity for the IT related investments is already in short supply, the unplanned and unsystematic implementation and use of IT in the education system will only result in the precious wastage of financial resource.

Thus for the developing countries like India, with scarce resources, even a little bit unplanned step or decision will surely transform the education system from a techno-savvy citizens to techno-phobia system. For that it is essential to remove all the myths prevailing in the education system regarding the usage and potential benefits of various IT tools.

One of the most frequently argument against the use of IT tools in the education system, by the critics, is that of “De-humanization” of the education system in-toto. In other words, it is argued that the emotional attachment, face-to-face interactions, and the behavioral adjustments all are vanishing from the system’s scenario by the use of IT tools in the education system. This problem is specially faced in the case of developing countries, where there is highly fragmented and hierarchical system of education is followed. But lacking the firm base and justification by various criticisms, this point is not well accepted in the developing countries and people are
now gradually realizing the importance and role of IT tools in the education system and also becoming aware of the potential and probable benefits supposed to be derived.

The second myth is the 'Ability of taking risks' regarding the usage of IT tools in the education system. With a well rooted understanding of the financial problems and besides that with a heritage of manual working conditions and practices, the parties involved in the education system, in the developing countries, are little bit hesitant of accepting the IT tools in the system. The discomfort with the new system and the lack of proper infrastructure and training methodologies regarding the IT related issues enhances further the problem of acceptances. But the example of the computerization of the Banking industry in India proved this point wrong. The strong support of all the employees for the 'Computerization' proves that if people are properly convinced about the opportunities of the IT tools then there will be no problem of acceptance of the IT tools in the system. Even the various Distance Learning Education Programs and the computerized library management system like UGC run by the University Grants Commission in India stands opposed to the myth that the IT tool usage can be a threat to the system.

The third myth regarding the role of IT in the education system is regarding the effectiveness of the learning methodologies imparted in the classrooms. Earlier it was easy to access the quality of the lectures delivered since all the students were in the visible range, their activities, their facial expressions, their attitude, style of conversation etc. were helpful for the faculty member to judge whether students are getting what is delivered or not. But the introduction of IT tools like internet, email, video cassettes etc. is blamed for wiping out this characteristic of the traditional education model. Thus it becomes must for all of us, present in this august gathering, to convince the various parties involved in the education system the effectiveness and opportunities provided by the IT to the education system and the role it can play in transforming the traditional educational models.

Now, discussing this issue, one can’t reach to any concrete argument unless and until, we can’t be sure about the various IT tools, their usage,
importance, role and their usage status in the developing countries vis-à-vis developed countries.

The use of various IT tools in the education system is not a new phenomenon in the developed countries but for the developing countries it's definitely like a revolution. The term "IT Revolution" which is of recent origin in the developing countries was introduced way back in, developed countries, the decade of 60's and 70's, when second and third generation computers started dominating the mind of people. At that time itself, the education system also incorporates those innovations and modified their system to a lot of extent. First computers were introduced in the education system and soon after, research activities, and libraries of various education institutions also joined the race and tried to minimize the chaos resulting by the use of various IT tools like computers, printers, etc. And the decade of 90's saw the mind boggling entities like virtual libraries, virtual universities, internet, worldwide web communication etc.

Today, in developing countries with improved IT infrastructures, level of awareness and the positive steps by the government helped IT to enter the education system also. For example, in world famous institute, IIT Mumbai, recently the students had a talk with the leading scientist of the world through video conferencing. Similarly the widening of the activity of UGC granted and developed programs, the IT has really started making a dent in developing countries also.

3.2 Usage of IT in developing countries:

Now after discussing the nature and role of IT in developed and developing countries, it's now obvious that we should go in further details about the contributions & potentialities of IT in the education system of the developing countries. In developing countries like India, IT can offer the following benefits to the education system besides the conventional benefits like imparting skill and knowledge:
1. Broadening the education base.
2. "Tailor made system"
3. Reduced cost.

The above three benefits are mentioned distinctly by keeping the developing countries in mind like India. Since the economic situation of
“More demand and less supply” of developing countries is totally different from that of the developed countries “More supply and less demand”, thus the earlier education system models developed, implemented and followed in these countries were aimed at reaching the mass at a subsidized rate. Unfortunately the social and cultural factors debarred from achieving this goal and thus the education in developing countries became prerogative of selected mass and unaffordable to the mass of the people. Also due to the non-availability and lack of proper infrastructure the education system was not that effective as it should be in developing countries.

But all these problems were supposed to be solved by the role of IT in the education system. The time and space constraints were removed and thus the education slowly and slowly started coming to be in the reach of the mass. This not only helped in widening the scope of education but also made education all pervasive. Moreover the awareness, among the student community and faculty members, about the use of communication modes like email and internet has not only created an information highway, but has also enhanced interaction among the two parties many many times. Thus, now the educational institutions also can claim to be “Institutions which never sleeps”.

In addition to this, following benefits are also provided by the linking up the education system with the IT revolution:

1. Removing geographical barriers.
2. Eliminating time and space constraints.
3. Enhancing communication among various parties.
4. Making education system all pervasive
5. Speeding up the learning process
6. Grooming of the faculty members and forcing them to be conceptually clear.
7. Improving the organizational effectiveness and efficiency.

3.3 IT as a transformation link: The Present and the Future

Learning is a lifelong pursuit and modern day learning uses many technologies including telecommunication and computer systems for two-way interaction to promote lifelong learning without regard to geographic
location or time zone. A few examples of the benefits of technology-enhanced learning are:

- For the institution, potential new students who reside outside the geographic area served are now a part of an expanded market.
- For the students, enormous resources are available at the click of a mouse.
- For the faculty, technology-enhanced courses are often easier to update and easier for learners to participate in.
- For both students and faculty, feedback and evaluation can be more immediate and accomplished more conveniently through e-mail and online conferencing.

However, a bewildering number of policies and procedures form barriers to the efforts of educators who wish to implement such program which are as follows:

- Meager resources available on most college campuses.
- There are also issues of coordination and control for those on campus who are charged with standardizing educational efforts, reducing duplication of effort when it is cost effective to do so, and accounting to university or other governing agencies. For these administrators, the ad-hoc, grassroots efforts of faculty and departments to develop and implement technology-based learning may be viewed as maverick efforts that create planning and implementation challenges.

Besides that one of the problems faced recently is the resistance of faculty. Professors may not be interested in seeing their lectures iterated ad infinitum via videotapes. Moreover, many professors fear for their jobs. But for the future days and despite these negatives, we do know that there are hundreds of class offerings on the Web and we can safely assume that many faculty are interested in pursuing this type of instruction. In fact, many offer it as a supplement to their current classroom offerings. College administrators need to begin having dialogues with professors and teachers' unions on the issues involved in Web-based distance learning. Possible outcomes include ones where, in exchange for reduced classroom teaching loads or even no classroom teaching, professors could offer courses on the Web. If class size became too large for professors to accommodate the requisite e-mail, chat, homework, etc.

Continuous research and efforts are on to make the Information Technology a potent tool for the restructuring of the education. For example, in one of the studies conducted by Coopers & Lybrand, it was found that higher education is often ill prepared to respond to the new changes. The solution recommended for this is 'Enterprise Process Engineering' (EPE) which is the methodology we use to describe the
application of Business Process Reengineering (BPR) across the enterprise. "Business" Process Reengineering has not been very successful in higher education for one significant reason:

higher education is different from "business" in character, governance, and scope. "Enterprise" stresses the need for an across-the-board shift in thinking and commitment to innovation. To achieve this result, an organization must change its focus from a hierarchical structure to one that consolidates related cross-enterprise tasks into cohesive processes. The EPE methodology also requires that the processes and objectives be "engineered." Too often, processes simply evolve. Tools and practices are built, but underlying processes are not always "rethought" from a business perspective. Because it is enterprise wide, an EPE effort must address all parts of the organization: jobs, skills, structure, information technology, management systems, business processes, and even values and beliefs. Moreover following nine steps were recommended as necessary to ensure successful Enterprise Process Engineering:

1. Identify strategic objectives
2. Determine important metrics
3. Implement a change-management program
4. Define processes
5. Capture the current method
6. Identify affected and involved parties
7. Model business processes
8. Apply best practices
9. Review and refine outcomes

Since the technologies of communication, which lie at the core of distance education, are advancing at a rate unimagined in even the recent past. Although distance education is but one small part of the technological revolution that is reshaping human communication, it is a central focus of that revolution and does offer enormous potential and opportunity for higher education in developing countries. Of particular benefit to higher education is the enormous potential that exists in multi-media, interactive programming, and digital-based delivery systems that are rapidly becoming available for wide-spread use and application. Multi-media capabilities in instruction significantly enhance and expand learning opportunities for students. Integrated sound, motion, image, and text create a rich new learning environment awash with possibility and a clear potential to increase student involvement in the learning process. The interactive capabilities of both program and delivery systems allow for feedback, dialogue, and ongoing assessment that are impossible in all but the most localized and direct applications of resident instruction. Emerging delivery systems offer the potential to extend the reach of education beyond all constraints of time and place and carry it into the work place, the learning center, and even the home
within the space of a decade. In short, the quality, management, access, availability, and efficiency of education can advance significantly through the use and application of technologies, particularly those of distance education, in service to learning. Moreover the technology is opening-up a new frontier in higher education that offers significant promise to improve learning and made it available to an almost limitless audience of learners. It is felt that technology will alter and reshape the entire landscape of higher education and that it is important to recognize and acknowledge this change and prepare for it as a coming fact of our strategic future. Those universities that embrace these realities will gain a significant strategic advantage over their counterparts and lay a foundation for future growth and stability. The examples of such universities is:

- The World Lecture Hall (www.utexas.edu/world/lecture/) offers hundreds of courses from universities all over the world, many with multimedia components.
- Internet University (www.caso.com/iuhome.html), a compendium of more than 30 colleges and universities, offers over 700 courses.

Besides achieving its goals, modern techno-savvy education will move our institutions towards becoming fully integrated "virtual universities", utilizing asynchronous learning networks in which students, faculty, and staff are linked by electronic mail, two-way interactive video, online processing, electronic databases, library services, multimedia on demand, and other information technologies, without regard to physical locations. The potential benefits of moving in this direction include:

- enhanced quality of instruction
- access to information and library resources
- high levels of support services to existing students
- increased access to academic programs by non-traditional students
- improved effectiveness in uses of limited human, program, and financial resources
- net revenue streams to offset infrastructure and operating costs
- incentives to faculty to develop new educational materials

4.00 DESIGNING EDUCATION SYSTEM FOR DEVELOPING COUNTRIES (LEARNING THE AUTOMATED WAY MODEL):

The subject matter of this paper and the discussion thereafter shall be incomplete if we do not position to suggest something concrete with respect
to the IT oriented education, which can be very well suited in the constrained environment of the developing countries like India and is characterized by the factors like lack of proper infrastructure, lack of awareness of various IT tools, low penetration level of IT in the education system, financial resource scarcity, demand exceeding the supply for the education etc.

Keeping in mind the above factors in mind, we propose here a model named as "LEARNING THE AUTOMATED WAY (LTAW)" model, which will be aimed at introducing students to the concepts and the tools of computer based automation in an academic setting.

In discussing the model we will first discuss the objectives of the proposed model then assumptions and will proceed further with the elaboration and the limitation of the model.

Objectives:
- Introducing the students to the concepts and tools of IT tools.
- Widening the base for the pervasiveness of education to the mass.
- Reduce the cost of providing the education.

Assumptions:
- There is a full support of the management and the faculty members.
- Staff members are aware of various IT tools and their usage.
- Government support is there in terms of sufficient budget allocation.

Elaboration:
As it is obvious that a medical doctor from the previous century would not recognize the technology in today's hospital, similarly a college professor from that era would see virtually no change in the tools of education. Thus the formulation of this model requires first and foremost the enhancement and comfortability of staff members with various IT tools. Once these criteria will be met, the model proposes to teach a required mainstream course using every possible new technology available, by these techno-savvy faculty members.

These faculty members will use all the technologies like World Wide Web, Internet, CD-ROM, audiocassettes and videocassettes, distance education, touch-screen multimedia training, autodidactic teaching systems and many more. As a result the work output expected from the students will increase significantly and the delivery system will reduce drastically. Also extensive writing and practice with information technologies is also required by the students.

Learning Model:
The paradigm shift, which this model proposes is that of considering students as co-discoverers of knowledge instead of Receptacles, a vessel to be filled at regular intervals with knowledge. This importance and a new
status of students will remove time and space boundaries by making the education system ‘Anytime-Anywhere’ model. Besides that students will be provided with TV facilities, link to Internet and World Wide Web, PCs for students, CD-ROMs in the library and some of the labs, so that they can be in a better position to take full advantage of the technology. The resulting trade-off with no tests and far fewer class to attend, they can mean other visits to campus can be for attending cultural events or symposia instead of punching a time card in a class.

Thus the ‘Bottom-Line’ of this proposed model will be three fold. Tougher, Better course and Lower unit cost. And good content and good teaching along with a model of such type, where students are considered as co-discoverers, not Receptacles, will definitely make the difference.

Limitations:
One of the major limitations of this model will be the cost consideration. Since the model involves a substantial investment in creating infrastructure, the government support and educational policies with the respective budgetary allocation will be having a considerable effect on the success of this model.

Last but not the least, it must be noted that the proposed model is not perfect in itself, and hence aims at providing a food of thought for the future researchers who are aiming for the restructuring of the educational system in the developing countries like India through the introduction of various IT tools.

5.00 CAUTION AND GUIDELINES FOR IMPLEMENTATION.

While designing the education system for the developing countries and keeping in mind the various constraints of such systems we must be cautious in introducing the IT tools in these education systems and forming the necessary guidelines for this new experiment. For that we must know various barriers which are obstructing our way of introducing the IT in the system. The barriers to maintaining technological currency and competency fall into two categories:

- **Personal barriers** include users' Comfort with present skills and/or ignorance of current technological capabilities.
- **Institutional barriers** include an institution's lack of Adequate equipment (e.g., the computers are too old to run new software, or the institution has no access to new software).

Besides one of the most important concerns is about the cost of higher education also there is concern about the output. There is concern about the adequacy of preparation in an increasingly complex world. At the same time these pressures are building on the outside, many faculties and
administrators and staffs within the universities would like to turn the clock back and pretend that those pressures don't exist. That's not a viable alternative.

Now once it is clear that what constitutes the barriers in introducing the Information Technology in the education system we are now in a position to frame the guidelines so that the 'New Honeymoon' can be fruitful and harmonious.

The first thing we are required to do while forming the guidelines is to decide the areas that will form the current policy framework. Following are the areas that will form current policy framework:

- Intellectual property
- Free speech and inquiry
- Advanced communications
- Telecommunications policy and regulation
- Distributed education

Secondly, we will be framing the guidelines, which can be briefly mentioned as follows:

- A visible and unwavering commitment from top management down
- Organization-wide ownership
- An understanding of reengineering
- Education and communication
- Well-defined roles and responsibilities
- Comfort with risk-taking, ambiguity, and learning
- A recognition of the need for fundamental change

6.00 PROPOSALS:

Though the points discussed in this paper, are not conclusive in themselves, but they can direct us to some suggestions which will definitely help us for the future references and also for the future researches. Following are some of the proposals:

I. Learning goals and content presentation

The identification and articulation of the learning goals and objectives provides the foundation for the instructional design, development, delivery, and assessment of an educational event. These defined goals serve as the contract between the instructor and student, defining what is to be taught and what is to be learned.

II. Interactions

When learners interact with one another, with an instructor, and with ideas, new information is acquired, interpreted, and made meaningful. Such interactions form the foundation of a community of learners. If students feel
they are part of a community of learners, they are more apt to be motivated
to seek solutions to their problems and to succeed.

III. Assessment and measurement

Assessment and measurement serve valuable purposes for both
instructors and students because they provide information on learner
progress, they measure achievement of learning goals, and they provide
learners with benchmarks for monitoring their progress and adjusting their
learning strategies.

IV. Instructional media and tools

Instructional media and supporting software tools should enable
educators to address the two primary barriers to distance education: the
learner’s feeling of remoteness and isolation, and the time it takes to
complete an instructional transaction. Although the promise of new and
emerging technologies continues to be realized, sound instructional design
practices need to maintain the proper focus on the educational process.

V. Learner support systems and services

The Learner support systems and services can be helpful in
establishing the organizational and administrative infrastructures to ensure
that educational programs can be efficiently and effectively developed,
managed, and executed and which are complete, responsive, customer-
oriented.

Last but not the least, it should also be noted that when educators
began to explore the Net as a teaching and learning tool, we were attracted
partly by the novelty of it, and partly by the opportunity to reach the hitherto
unreachable student: the person too far from the classroom, too poor or too
busy to return to school. We saw online instruction as the continuation of
classroom teaching by other means. But the trends and issues that interest us
most in online instruction are those that challenge the ideas about teaching
and learning that we have always taken for granted.

Every time we teach an online course, we learn something new and
unsettling about ourselves. Our role is changing; so is that of our students.
None of us is entirely comfortable with the change. It's almost like going
through adolescence again: the changes are exhilarating but frightening, and
we feel torn between the desire to try out our new powers and the fear that
we'll foolishly waste or misuse them . . . or find out we don't really have
them after all. Thus it is necessary for us to have a look at some of these
myths. The resulting confusion along with probable answers to these myths
are given in the table below:
<table>
<thead>
<tr>
<th>Myths about Online</th>
<th>Questions raised</th>
<th>Some answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>It's NOT cheaper or easier than F2F (face-to-face) teaching</td>
<td>If computer instruction is so expensive, can we afford it?</td>
<td>Computer instruction is expensive, but it's getting cheaper every day.</td>
</tr>
<tr>
<td>It's NOT for everyone.</td>
<td>If online instruction isn't for everyone, should we be investing so much energy and money in something that benefits only a small minority of our students?</td>
<td>As the technology becomes ever cheaper, traditionally disadvantaged groups will find ways to exploit the medium in startling new ways.</td>
</tr>
<tr>
<td>It's NOT better than F2F teaching.</td>
<td>If online teaching isn't better than F2F, can we justify going online at all?</td>
<td>For the isolated student, the online course may not be quite the same as a class in &quot;meatspace,&quot; but it may literally be a lifeline.</td>
</tr>
<tr>
<td>It's NOT the wave of the future.</td>
<td>If the present text-based systems won't last, why not wait until technology provides a real equivalent to the interactivity of the classroom?</td>
<td>We are trying to master a transient technology while superior technologies loom in the future.</td>
</tr>
<tr>
<td>It's NOT organized like a F2F course.</td>
<td>If online courses are basically hypertextual, why are we fooling around with a medium that's intrinsically hostile to the way we think and read and write?</td>
<td>Hypertext has its uses as well, and it imposes its own discipline; for some teachers and students, it is a discipline worth accepting</td>
</tr>
<tr>
<td>It's NOT a pure medium</td>
<td>If it's foolish to rely solely on the Net or Web, then what particular aspects of teaching and learning are uniquely suited to the online medium? Under what conditions?</td>
<td>One-on-one tutorial medium can flourish best online. Many students learn nothing until learn the lesson that way</td>
</tr>
</tbody>
</table>
It's NOT politically identical to F2F teaching.

If online course is not going to have the mentor-apprentice relationship which we understood and liked, why throw that away for a relationship that may not serve teacher or student very well?

Every thing can be considered as best under certain situations till alternatives are not available. With increased awareness, the new system become more suiting.

### 7.00 SUMMARY

The models of education being followed by most of the developing countries are under severe criticism as they have been unable to groom the human resource of these countries in the way it was sought. Frenetic efforts are on in all these countries to design an education system that can address to the needs of today and tomorrow. Furthermore, the challenge that 21 century threatens to pass on account of the bewildering change associated with it challenges the educationalists to devise a model of education that not only produces individuals who posses human values, conceptual clarity, professional skills and creativity but also have the flexibility and foresight to take on the challenges of change.

In this context the authors of this paper have tried to elaborate on various issues regarding the role of Information Technology in the education. Following points can be helpful in summarizing the whole discussion:

- In the distance education system indeed, the more hands-on skills required, the harder it is to teach a subject at a distance, although it can be done. It is stated that classroom-delivered courses are often spoon feeding, whereas technology-based learning stretches the intellectual muscles.
- Secondly the question of chances of loosing F2F contact is very predominant. But we do amazing things with video, with voice, with data, that we could never have done before and especially for those students who cannot come to campus.
- After decades of promises based on overhead projectors, classroom video, teaching machines, and other instructional technologies, the ability to improve instruction by integrating digital technologies across the curriculum has now become a reality.
• The (Surprising) Benefits of IT in Education
  1. The technology-based exploratory tools developed offer opportunities for students to work together cooperatively, which was otherwise impossible in a lecture format.
  2. Information technology empowers a community to transform itself.
  3. The ability to transfer some of the power of information from publishers to individuals.
• The distance education can increase the quality of education and research, utilize resources more efficiently, increase the effectiveness of scholarship and learning, and expand the ability to provide service.
• One of the great things about computing in higher education is that it is fun, at least most of the time. This may shift our focus from utilization of the IT tools to that of entertainment.
• The IT tools have changed the way people throughout the world interact with one another.
• If we want our working environment to be as good as our technical environment, we must develop the culture we want with the same zeal that we bring to developing our networks.
• We must learn how to convince non-technical managers of the underlying complexity of what may seem to them to be obvious.
• Information technology is magnifying our human potential on a global scale.
• Advances in computing technologies, such as high-resolution displays, 3-D graphics and animation, handwriting and speech input, and natural language understanding will be used to improve the end-user interface, to facilitate personal interaction and customization with computers.
• The paradigm shifts in computing are not restricted to hardware platforms and networks (mainframe, client/server or network-centric). As technology matures, there is an evolution in its use also.

The 1990s have been a period of significant change on the part of our universities. If we are to respond to the challenges, opportunities, and responsibilities before us, a key element will be the efforts to provide universities with the capacity to transform themselves into entirely new paradigms that are better able to serve a changing society and a profoundly changed world. This time of great change, of shifting paradigms, provides the context in which we must consider the changing nature of the academic research enterprise itself. We must take great care not simply to extrapolate the past but to examine the full range of possibilities of the future. From this perspective, it is important to understand that the most critical challenge to be faced by most institutions, will be to develop the capacity for change; to
remove the constraints that prevent institutions from responding to needs of rapidly changing societies; to remove unnecessary processes and administrative structures; to question existing premises and arrangements; and to challenge, excite, and embolden all members of the university to embark on what I believe will be a great adventure. Those institutions that can step up to this process of change will thrive. Those that bury their heads in the sand, that rigidly defend the status quo -- or even worse, some idyllic vision of a past that never existed -- are at very great risk. Those institutions that are micromanaged, either from within by faculty politics or governing boards, or from without by government or public opinion, stand little chance of flourishing during a time of great change.

8.00 REFERENCES:


6. J. D. Gilbert (1993), "Are We Ready for the Virtual Library?" Information Services and Use.


DIGITAL RADIO: OPENING WINDOWS OF OPPORTUNITY

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