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<td>Author(s)</td>
<td>V. S. Gupta</td>
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ABSTRACT

The Asia-Pacific region is witnessing a fast growth in the area of information and communication technologies, telecommunication, micro-electronics and electronic media. The convergence of these technologies offers a unique opportunity to the educational planners in Asia to innovate and experiment with concepts and procedures like Teleconferencing, Virtual Classroom and Virtual Online University for enhancing options and choices for those working and learning through distance education and open learning system.

The paper discusses the developments and trends in tele-education and cites the case studies in the Asian countries, particularly China and India and also studies emerging trends in the use of educational technology, electronic media and teleconferencing for instruction purposes. The fascinating and vibrant developments in creating Virtual Classroom and Virtual University, in the wake of the spread of internet, have made transnational teaching a distinct possibility. Finally, the paper briefly examines the futuristic possibilities for tele-education and Virtual University in Asia.
The contemporary society is characterised by the swift pace of change which affects our lives in diverse ways: rapid technological development, faster evolution and aggregation of knowledge, rising aspirations of the people towards a more fulfilling quality of life, increasing demand for qualified and trained manpower, and exponential growth in the media and communication industry. The harnessing of the potential of communication technologies for educational purposes — not in the restricted sense of structured formal academic system, but by way of opportunities for lifelong learning available throughout the life span of an individual, has been another notable characteristic of nineties which has brought about a conspicuous shift in the paradigm of education and learning.

Keeping in view the new and larger audiences of learners and participants in the educational process, new content and curriculum changes, education and learning are no longer confined to a standard format of a traditional classroom which offers highly restricted environment. Even during the closing years of twentieth century when expanding educational needs have given rise to different modes of teaching, there are subjects and situations -- like music, painting and fine arts -- which are still best imparted in the traditional Gurukul and guru-shishy parampara. Such traditional modes of learning and teaching have their own advantages -- the opportunity of greater and personal interaction between the learner and the teacher, and the greater degree of refinement which these areas possibly demand. These traditional methods of imparting education have been, however, too restricted to cater to the growing demand of industry and professions and number of students who wish to acquire a degree of competence and proficiency in the shortest possible time period in order to meet the requirement of 'ever-competitive scenario'.

V S Gupta is a Professor at Haryana Agricultural University, where he conceptualised and implemented as Course Director the Post Graduate Diploma Course in Agricultural Journalism through Distance Education and Communication and Writing Skills in the university for in-service scientists from agricultural universities research institutes. Prof. Gupta has edited and authored over half a dozen books singly and jointly, including Third Revolution in Indian Perspective — Contemporary Issues and Themes in Communication.
Catering to Expanding Educational Needs

The educational needs of the population have greatly expanded, both in the developing and developed countries. The educational system should, therefore, be geared to meet the requirement of not only the large numbers of people to be reached, but also in terms of new disciplines, curricula and subjects in tune with demands of industry and economy.

The following observations made in the Broadcasting for Adult Education (1972), a UNESCO document, underscores the vast responsibility that rests with the educational planners in formulating workable strategies towards providing educational opportunities for those who missed out in the first instance:

Many thousands of working young people and adults in many countries are looking for a chance to complete elementary, secondary or higher education -- those who were not given the chance to receive formal education during their adolescence because of the shortage of school; those who have missed their chance, dropping out school or college, because of financial, health, family or other reasons. (page 21)

Human knowledge is rapidly expanding. In many fields degrees gained years ago are no longer adequate qualifications. The introduction of new technology, new production methods, new techniques advance more rapidly than the setting up of new specializations and new curricula at colleges, universities, and other academic and vocational education establishments. In recent years much attention has been given to the more and more urgent continuing education needs of the graduate force. (page 26)

Sunset Students — Tryst with Education

Of late several Indian news magazines have brought out news features on 'Sunset students', hair turning grey but with one commitment in life -- to pursue higher education. All these students -- retired/retiring defence personnel, housewives, in-service staff who wish to attain higher educational qualifications for improving their employment prospects, are pursuing higher education through distance education and open learning institutes. For the older generation -- bitten by the higher education bug, age is no bar.3
The role of the teacher -- the key to the success of the educational system -- also has to be changed; instead of dispensing information and knowledge he has to guide the students in the acquisition of knowledge from the ever expanding learning resources. All these developments have led to a dramatic expansion in the Open and Distance Education not only in schools, colleges and universities but also in industry and commerce. Besides the United States and Europe, the system of the Distance Education and Open Universities, has made significant progress in the Asian region -- more particularly in China, India, Australia, Thailand and Malaysia.

Educational Technology

The Open and Distance Learning System would not have created a viable and lasting niche for itself, within the overall traditional educational system of classroom teaching and university education, but for the extensive use of media and communication technologies.

As technology advances, the ideal of learning, "what you want, when you want, where you want, and at your own pace, "becomes possible and life long learning is no longer just a slogan. The report of the International Commission for the Study of Communication Problems -- *Many Voices, One World* says: The rapid development of communication in most countries, the expansion of various forms of mass communication and in particular of audiovisual communication, combined with the spread of informatics, open up new horizon and multiply the linkages between education and communication. There is an evident increase of the educational potential of communication. Endowed with a greater educational value, communication generates an "educational environment". While the education system loses the monopoly of education, communication becomes itself a vehicle for and subject for education.

The future of educational media appears extremely promising. In recent years, a series of exciting new technological developments have significantly expanded and enhanced the instructional potential of television. Likewise computer technology has advanced at a remarkable pace, and should play a key role in the future educational expansion. The electronic media offers new dimensions to expand educational opportunities, to improve the quality of instruction, and to increase the cost effectiveness of the present educational system.

Advanced communication technologies such as videotex, teletext, videodisc and computers are being used for education in developed countries. Being expensive and
sophisticated, these technologies are not frequently used in developing countries for educational purposes.

**Tele-education, Open and Distance Learning**

While considering the application of communication technologies to education, tele-education, by all means, has been considered to be a landmark development. The extensive use of television for educational purposes in Asia in the two most populous countries of the region -- China and India, the limitations of being one-way medium notwithstanding, is indicated by two important developments: (1) The largest distance teaching institution of the world, the national multimedia distance learning institution in China, is called the Central Radio and Television University (CRTVU), and (2) One of the largest communications experiments in which television programmes were received by local viewers directly from space -- Satellite Instructional Television Experiment (SITE) was conducted in India for a period of one year from 1 August 1975.

The above two instances of application of communication technology, with television playing a pivotal role, are being taken for a detailed discussion, alongwith further developments in tele-education.

**Central Radio and Television University (CRTVU)**

China is one of the pioneering countries in the world to have exploited television medium for expansion of education. The CRTVU, employs broadcast as the main delivery vehicle and supplements it with print, audio-visual media, tutorials, and computerized instruction. Programmes are broadcast directly to learners at home, in the workplace or the study centres located throughout the country. The CRTVU courses follow a multi-media approach. The input of non-print media varies according to the subject area -- science and engineering courses have greater proportion of TV programmes, whereas radio is the chief medium for social science courses. TV programmes are transmitted by the Central China Television (CCTV) nationally through the microwave network.

The CRTVU -- the apex institute, is backed up by the Provincial Television Universities. Academic programmes are offered in a large number of disciplines including engineering, sciences, economics and management: Academic courses are designed on a nation wide basis, but provincial universities implement the guidelines
provided by the CRTVU. Enrolment and examinations are controlled centrally and most eminent writers and presenters are invited to produce TV programmes.

The remarkable aspect of the working of CRTVU is the expansion of its operations in rural areas to meet the shortages of technically trained manpower. In his paper -- China's Radio and Television University -- World's Largest Network of Open Universities, G Ram Reddy gives his assessment about CRTVU's contribution to education in China: A vast network has been created to meet the shortage of educated persons in various fields and also to meet the demands of fresh graduates from high schools. Since it is not possible for the provincial universities to meet these demands, the society is looking to the Radio and Television Universities to cater to these demands. During the last eight years these universities have made a tremendous impact on the educational system in the country.

Satellite transmission is the kernel of China's distance university system, linking the Central Chinese Radio and Television University in Beijing to the network of 43 other open universities throughout the country. (Wei and Tong, 1994, quoted in the paper by Desmond Keegan, see Notes 18).

*Satellite Instructional Television Experiment (SITE) -- 1975 -- The Indian Experience*

The SITE was a one-year pilot project, launched during 1975-76 to assess the feasibility for centrally conceived and produced messages to be distributed simultaneously throughout large geographical areas without relying on extensive relay or retransmission facilities. Such a capability vastly increases the potential audience for development broadcasts of all kinds. Conceivably satellites may soon permit nations to circumvent the development of extensive terrestrial communication systems.

Primarily undertaken to experiment with television through satellite communication to broadcast special programmes in six states which included 2400 villages, the experiment aroused wide international interest. India was the developing country in the region to undertake an experiment using space age technology to bring its millions into the mainstream of national life, make them aware of the first changing pattern of present day urban life and help them to harness their resources for optimum benefits. Explaining the importance of SITE, Narayana Menon (1976), in his book, *The Communication Revolution* wrote:
SITE means a lot of things apart from being an experiment. For one thing, it made India TV-conscious and of an advanced style of TV technology. TV is no more confined to the main metropolitan centres. It has suddenly made its presence felt in the villages of Karnataka, Andhra, Orissa, Madhya Pradesh, Bihar and Rajasthan. Hundreds of engineers, technicians and mechanics are acquiring new skills and vast experience. Programmers, broadcasters and telecasters are getting new insights into the medium. In spite of all the doubts and hesitations, bureaucratic stumbling blocks, genteel in-fighting, shortage of equipment, facilities, money, we are in the middle of a vast learning process, the culmination of the tentative approaches of the tele-club days of 1959. All these things add up to substantial investments which should, in the long run, bring rich dividends. As Vikram Sarabhai* said, television in an investment rather than an overhead.

Another observation on SITE is equally noteworthy: India, SITE experience does provide a vision of what rural communications might become and a much clearer indication than has heretofore been available of the range of administrative and programming that are embodied in so powerful a technology.

Countrywide Classroom (CWCR)

The Countrywide Classroom (CWCR) project of the University Grants Commission (UGC) has been the logical outcome of the successful SITE experience. The rapid expansion of television in India during 1984 -- when one TV transmitter was being installed every day -- facilitated the launching of the above programme, aimed primarily for the undergraduate students of colleges located at different places. The contents of CWCR programmes are not linked to any examination, these are neither based on a particular syllabus. Instead these telecasts seek to provide new insights, bring new findings and take the students to various places and laboratories they would rarely see. The project aims at the widest possible utilisation of television’s potential to improve the quality of university level education. These educational video programmes are telecast twice a day over the Doordarshan network using INSAT Satellite system. The UGC has established a number of media production centres all over the country for producing these programmes. India, in fact, has one of the largest networks for producing quality education software which include Audio-visual Research Centres (AVRCs) and Educational Media Research Centres (EMRCs) -- under the aegis of the UGC. The establishment of the Indira Gandhi National Open University (IGNOU)
represents the government's attempt to provide higher education through the use of multi-media distance teaching methods. The establishment of the Central Institute of Educational Technology (CIET) in 1984 and also the State Institutes of Education Technology (SIETs), with the objective of utilising educational technology for the improvement and spread of education in the country at the school level, is one major step towards utilising the media for elementary education. Some of the major concerns at present -- qualitative improvement and regular availability of programmes wider coverage, to the users through telecast -- have been articulated on different occasions.

**Tele-education Programmes of IGNOU**

Since 20 May 1991, Doordarshan has been telecasting curriculum based video programmes produced by IGNOU, an important component of its educational methodology which aims at making the teaching-learning process interesting both for the student and the teacher. The target audience for these telecasts are primarily IGNOU students spread over throughout the country.

In order to assess the utilisation of telecasts by the students, as also to get insight into the quality of these programmes, as assessed by the students, a study was conducted by the Communication Division of the University. The study, essentially a one-shot survey research project, was conducted at the 33 study centres located in 16 Regional Centres throughout the country with 431 respondents out of 1498 respondents responding to the questionnaire. The research study was, therefore, at best, sketchy in terms of the total number of courses and the percentage of students who were covered in this survey. The questionnaire was bilingual -- in English and Hindi and the participants were drawn from two programmes -- Management Programmes and the Bachelor's Degree Programme. The survey revealed that single most important reason for not watching the telecasts was unsuitability of the telecast time, the other being non-possession of TV sets. A majority of non-watching respondents indicated that a repeat telecast in the evening would help a large number of students to watch the telecasts. If it was not possible to shift the telecast time or repeat telecast is not possible, some alternative channel of reaching the students would have to be explored.

The study made the two important suggestions for strengthening the tele-education programmes of IGNOU:

1. The possibility of telecasting from various regional transmitters with different schedules
should be considered in addition to/instead of the present nation wide telecast. Since the mandate of the university is to bring higher education to the large number of citizens, an effort is urgently required to produce programmes in the language, the students are adequately conversant with.

2. Close interaction and cooperation among the producers, script writers, faculty members and the production team is required for preparing an effective educational programme.9

Educational Teleconferencing

Limitations inherent in tele-education have been pointed out in several discussions on the use of television for teaching and distance education purposes. The most serious limitation, of course, is that television is strictly a one-way communication. The teacher-taught contact, considered all important for any successful educational endeavour is missing, in the case of television. Gopal Sakesena10 elaborates this rather graphically: No personal contact, no physical identification, no scope for repetition, clarification or elaboration. The gap between the sender and the 'receiver' is too wide to be easily bridged. A teacher's personal touch and care are not a 'diminishing commodity' subject to the vagaries or showmanship of the medium of television. Hence, TV and teacher should prove to be more of companions than competitors. Reddy points out: The problem with television programme is that are ephemeral, cannot be reviewed, are uninteruptable and are presented at the same pace for all students. Bates writes, "A student cannot reflect upon an idea or pursue a line of thought, without losing the thread of the programme itself. A student cannot go over the same material several times until it is understood" (1984 : 29).11 In developing countries, there is however the problem of accessibility to television. In India, the vast majority of the students of open university are not likely to have television in their homes. In such circumstances, they have to use either a community television facility or go to the nearest Study Centre for watching the television programmes.

The emergence of the new forms of electronic media like teleconferencing is of particular interest for distance learning because of their interactive capabilities. The use of electronic media components as an essential part of the multi-media approach to distance learning has always been a dream for those working in developing countries.

Teleconferencing is an interactive electronic communication among two or more
locations. The punch word here is interactive and it is indeed this quality of interactivity that really distinguishes teleconferencing from the conventional one way media like broadcasting or narrowcasting.

Teleconferencing is an already accepted form of technology in advanced countries, especially for business communications. It is only a matter of time for this technology to become popular in developing countries as necessary infrastructure like telephone links and satellites are being made available. Usually, the attraction for adopting teleconferencing is said to be the savings it results in minimizing physical travel. The time-saving involved in this process is also a significant factor. Experience of advanced countries in this process is also a significant factor. Experience of advanced countries in which teleconferencing is in wide usage shows that apart from economy and time saving, this technology improves corporate efficiency and enables participatory management.

The need for communication, staff development, and expert resources makes teleconferencing a particularly appropriate means for distant education institutions. The use of telecommunication to facilitate two-way communication among a number of students located at different venues is the basis of educational teleconferencing. The opportunity for introduction between the experts and the students, which teleconferencing so readily affords, has made it a particularly valuable learning technique.

Teleconferencing--- The IGNOU and NOS Experiments

The two apex distant learning institutions in India, IGNOU and NOS (National Open School) have, during the recent years, initiated efforts to incorporate teleconferencing as a component of instructional and management methodology.

The teleconferencing experiment of IGNOU, from 4-13 October 1993, essentially a one-way video and two-way audio -- was conducted to explore the feasibility of telecommunication based interaction in Distance Education. It was one of the components of the Extended Contact Programme (ECP) of PG Diploma Course of Higher Education. The two major objectives of this experiment were: to understand the potential of telecommunication in distance education and to get feedback regarding multimedia approach using talk back system.

The training programme was conducted through live lectures and discussion mode, supplemented by computer-based graphics and charts, audio-visual aids and discussion.
During the discussions, the participants used STD telephone facilities for asking questions in audio mode. The questions were answered using the audio and video mode.

The IGNOU Experiment was the subject of study by Sahoo (*Indian Journal of Open Learning*, Vol. 3, No. 1) and Bhalia *Media Asia* 1995 (Vol. 22, No. 4). It was concluded:

Several objectives were achieved through teleconferencing viz., clarifying doubts of participants in their studies, giving direction for different activities and reviewing the progress of activities during ECP, encouraging interaction between participants and resource persons, etc.  

Bhatia suggests: Interactive narrow casting networks can be the most effective tool for HRD and training. These networks have the capability of reaching out to a very large number of selected audiences with common interests, and provide them with information and education. They have interactive capabilities, and therefore, the learning from such networks can be very high. Such networks can have very great potential for human resource development for sustainable development in the region. The establishment and utilization of such networks at the regional level need to be seriously explored.

Teleconferencing -- NOS Experience

Open Schooling has evolved as one of the successful experiments in alternate schooling in the last 2-3 decades. Many have remained outside the purview of formal schooling due to socio-economic, geographical and such other reasons. Open Schools adopt distance learning methodologies which include self-learning printing materials and audio-visual cassettes; telecommunication and multi media approach to teaching with the possibility of learning at one’s pace, place and convenience has helped in catering to the individual differences of the learners.

India is one of the pioneers in Open Schooling in the world. The Government, in the Ministry of Human Resource Development, established the National Open School in 1989 for providing an opportunity for schooling to dropouts, young girls, adult women, ex-servicemen and handicapped persons. NOS has a diverse school profile having young and old learners, ranging from 14 years to as old as 89 years, living in different parts of the country. More than two hundred thousand students have so far enrolled in NOS through 800 study centres.

The NOS is confronted with a huge task of training teachers from the traditional system
who needed orientation and training to perform effectively in the open learning system. The NOS conducted the training programme for 180 teachers drawn from different districts of Gujarat for 3 days from 17-19 December 1996. The mode of discussion was through satellite based and telephone based one-way video and two-way audio conferencing. The interactive network comprised one studio teaching centre at ISRO, Ahmedabad and six receiving centres spread over the State. The experience gained would help NOS to use this technology more effectively in a massive countrywide operational system.

An other interesting example is creation of network entitled 'A Database for Legal Research', configured in Bombay not merely for information transfer but also for the selection and acquisition of the needed information in an interactive mode. Through this network, information needed by the advocates/legal experts for legal research can be obtained through a satellite link between the central computer in which the data base is located and a terminal/personal computer installed in user premises. The database is continuously updated with changes in statutes and judgements.

US -- A TALEEM Initiative

TALEEM Research Foundation, a literary, scientific and charitable society and trust, set up in May 1996 has launched a unique initiative to provide wide and easy access to learning opportunities via satellite television and information technology. The US--University in the Sky, is proposed to be set up under the Private Universities (Establishment and Regulation), Bill 1995. The US will launch multimedia and computer technology based courseware for skill upgradation, capacity building and training programmes customised to suit industry and institutional needs.

Virtual Reality, Virtual Society and Virtual University

The idea of Virtual Reality -- according to the Virtual Reality Primer, has been around for over 25 years, but suddenly the term is cropping up all over the place -- in trendy magazines, on cable news networks, and, now in academic journals as well. Interestingly the dictionary defines virtual, "as existing or resulting in essence or effect though not in actual fact, form or name", and reality is "the quality or state of being actual or true". As technology, Virtual Reality is being defined as, an interactive computer system so fast and intuitive that the computer disappears from the mind of the user, leaving the computer-generated environment as the reality.
Virtual Reality is a creative communications medium for everyone. It will influence how we design things and run our businesses, how we teach our children and treat our illnesses, as well as how we spend our leisure time. Virtual-reality environments or scenarios can be pre-defined and focused so that a user can gain specific skills or insights as if he or she were actually on the job.

In one of his papers in *Media Asia*, Dahlan says: The excitement and enthusiasm to get plunged into the information highway, for instance has propelled a part of our own societies (a small segment, to be sure, but the most influential segment nonetheless) to live in two societies at the same time: the real society in our own country and virtual society. To live simultaneously in both real, physical space and in cyberspace. We may not know or be able to evaluate which is real and which is virtual.

Virtual Reality attempts to simulate real life experiences by projecting digitally created scenes on to the human brain by various means. If realized to the fullest extent its capabilities would be mind blowing and its implications staggering. From Virtual Reality to Virtual Classroom and Virtual University is a natural extension of application of communication technology to education.

Interestingly the distance education theorists during the recent years have attempted to classify the use of teaching aids and technologies into generations. A general classification is as under:

1. **Generation I** — Mailable materials: including print material and audio and video cassettes.
2. **Generation II** — Education through Air: Broadcasts, Telecasts, Talkback TV
3. **Generation III** — Computer based teletechnologies: CD-Rom, Multi-media and Internet
4. **Generation IV** — Technologies of Immediate Future: Virtual Classroom

Desmond Keegan from the University of Dublin, in an interesting paper¹⁸, recapitulates his observations about teaching and learning in a European Virtual Classroom. Keegan defines Virtual Classroom as:
A Virtual Classroom comprises an electronic classroom from which the class is taught, a network of specially equipped electronic classrooms at which the students are present, and the satellite, microwave or cable linkages between them. For teaching purposes, virtual classrooms can either be two-way video with two-way audio, often called videoconferencing or more accurately video teaching' or one-way video and two-way audio.

The paper details the above mode of education employed for the 'Certificate in Safety and Health at Work', by the University College of Dublin during 1993-94. This was one-year, part-time study programme of about 150 hours. Lecturers would deliver lectures in a broadcast standard educational television studio at the university. The sound and vision output was sent by a permanently installed microwave link to the national television transmission centre. From here it was retransmitted by the EBU uplink to Eutelsat and then downlink to the satellite dishes at colleges and centres and other receiver sites. The didactic structure of the course was paid great attention. An observation from the conclusion is a pointer towards the expanding concept of virtual classroom and its application in future:

Transnational teaching face-to-face at a distance is now a reality and successful systems have been reported in the literature. There is, for instance, cable from Dublin to Stockholm, so it is entirely feasible to set up a two-way video, two-way audio virtual classroom between the two cities. For the first time a student fidgeting in Stockholm could disturb the teacher and the rest of the class in Dublin or a student in Dublin could interact with the teacher in Stockholm. Eutelsat II F4 has a footprint that covers the whole of Europe and viewers from Netherlands, France and Italy participated live by telephone in the 1993-94 academic year course. Students can now participate in an international classroom in which students from all over Europe are classmates.

Another instance of the working of Virtual Classroom at Monash University's Gippsland campus in Victoria, Australia has been reported in his paper, Virtual Classrooms: Real, Accessible, User-friendly, by Neil Hanley in Media Asia (Vol. 22, No. 4, 1995).

Hanley discusses in about Net Face (Network Interface), an evolving piece of computer software which provides on-campus, distance education and mixed mode
students in some semester-subjects with easy access to a variety of online services. Hanley had a more ambitious aim - to converge the on-and off-compus students and mixed mode populations in a 'virtual' classroom and believed NetFace could evolve to help implement the concept of a virtual university' based on group and collaborative, as well as individual learning.

NetFace is still in a prototype stage of implementation. He adds: When all students can access the graphic power of Internet, when they can retrieve (cut and paste) information electronically, when they can search the information universe for what they wish to know, then the virtual classroom will be a reality.

Asynchronous Learning Networks

Dr. Burks Oakley, Professor at the University of Illinois has reported a more comprehensive pilot experiment in creating Virtual Classroom, as well as 'Virtual Learning Community', at the University of Illinois.

The pilot essentially involves implementation of several innovative uses of computers and computer networks to develop a new pedagogy for delivery of university engineering courses. Since the approach involves asynchronous access to networked learning materials, the initiative has been called as "Asynchronous Learning Networks".

The faculty at the university realised that with the increased access to networked computers on the campus, the students did not have to depend on "stand alone" courseware; software programme was expanded to include electronic submission and grading of all home work assignments and quizzes over the Internet computer network.

Dr. Oakley states: It seems that this approach is improving student learning. The network-based homework gives students immediate feed back. Rather than have to wait several days for their homework to be graded, students learn the results immediately. If students do not get the solution completely correct on the first attempt, then they are motivated to find their mistakes and submit the new answers. Another pedagogical feature is that students have a home work deadline every five days (on average). This encourages them to study the course material on regular basis.

In the 'Vision of the Future' Dr. Oakley concludes: Asynchronous, network-based, interactive learning environment should find more uses in the future, as more students have
access to computer network where they live and study. This technology may permit us to offer self-paced courses to all students; individual students would be able to use the network to communicate with other students at a similar stage in the course. Our network-based approach should be useful in the delivery of continuing education courses to the engineers. With the explosive growth of the World Wide Web, we can expect to see many of the key features of our interactive learning environment be implemented on the web, where they will be more universally accessible.

The above three instances from Ireland, Australia and USA do give an overview of how concepts of Virtual Classroom and Virtual University are beginning to emerge as distinct possibilities as a result of innovative use of new information and communication technologies in education.

Virtual Online University

In the USA the idea of Virtual Classroom and Virtual University has already taken off in the right earnest. David Hawkridge mentions the existence of Virtual Online University in the USA which was established in April 1994.

The Corporate Mission Statement of Virtual Online University is:

- to provide low-cost, high-quality education;
- to offer distance education using interactive, interdisciplinary methods outside of traditional learning paths;
- to assist traditional and non-traditional learners in furthering their educational objectives;
- to form working relationships with business and industry to provide students with valuable hand-on experience to supplement a liberal arts education;
- to conduct research and provide a practical forum for investigation of online environments and applications in distance education, telecommunications and electronic delivery systems.

According to Dr. William Painter, Executive Director, VOU will "... target two primary audiences: first, current college and university students in traditional education paths who
wish to broaden their opportunities with online education; and second is the non-traditional,
learning-disenfranchised person, that is, individuals who have limited access to traditional
education due to financial restrictions, physical challenges, being part of at-risk population, or
with responsibilities which preclude pursuing traditional educational paths."

Apart from the above VOU, dozens of school districts in the USA are experimenting
with intranets on local networks (LANs) as carriers of interactive multimedia formal
educational content. The rapid spread of Internet has given a new edge to the possibility of
Virtual Classroom and Virtual University in the Asian region. Even in a country like India,
which is quite down the line with regard to access to telecommunications and computers,
corporate offices, commercial establishments and media comments are up beat about 'Virtual
Office'. Although the scenario presently is uncertain but the following excerpt from the
Dataquest (July 1994) does indicate the trend, however tentatively:

Outdated telecom facilities, high cost of connection, a waiting list that never ends, low
technological awareness, bureaucratic interference .... can any kind of revolution ever take
place in India? and adds, "A sane person would think twice before betting that India would
be a part of the information superhighway. But, five years down the line chances are the
country would have networks similar to the best of the world.

While five years may be too early a period, it is certain that use of internet for education
in India has made an earnest beginning. The nationwide computer network of the Planning
Commission, NICNET (National Informatics Centre) is linked through satellite dishes
around the country. It is also connected to internet and other international networks and
databases. The Education and Research Network (ERNET) connects the Indian Institutes of
Technology and other prestigious science and research institutes. The facsimile facilities
have now become common and electronic mail is becoming available even in some district
towns, apart from the state headquarters. That facilitates progress towards creating a Virtual
University.

Creating a Virtual University in Asia--A Vision

In the Asian region dissemination and sharing of knowledge within the structured
education system are still basically class-room oriented, paper-intensive processes. Those
institutions which take advantage of advances in technology, especially those linking their
schools to powerful networks, rich data bases and instructional equipment, will be able to
provide quality educational opportunities to greater numbers and perhaps ultimately in a cost effective manner.

Let us look at the ground realities in the realm of access to telecommunications in Selected Asian Economies in the table below (excerpted from Heather E Hudson’s paper - Restructuring the Telecommunication Sector in Developing Countries - Lessons from the Asian Experience, Media Asia Vol. 24, No. 3).

Access to Telecommunications in Selected Asian Economies

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<td>0.77</td>
<td>35.9</td>
<td>11.32</td>
</tr>
<tr>
<td>Rep of Korea</td>
<td>39.7</td>
<td>2.16</td>
<td>6.87</td>
<td>32.4</td>
<td>11.25</td>
</tr>
<tr>
<td>Singapore</td>
<td>47.3</td>
<td>8.36</td>
<td>10.85</td>
<td>38.0</td>
<td>15.26</td>
</tr>
<tr>
<td>Taiwan</td>
<td>40.0</td>
<td>2.75</td>
<td>5.71</td>
<td>31.5</td>
<td>8.09</td>
</tr>
<tr>
<td><strong>Emerging Economies:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southeast Asia:**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>1.3</td>
<td>0.04</td>
<td>0.41</td>
<td>14.7</td>
<td>0.28</td>
</tr>
<tr>
<td>Malaysia</td>
<td>14.7</td>
<td>2.93</td>
<td>3.28</td>
<td>23.1</td>
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</tr>
<tr>
<td>Philippines</td>
<td>1.7</td>
<td>0.30</td>
<td>0.09</td>
<td>12.1</td>
<td>0.52</td>
</tr>
<tr>
<td>Thailand</td>
<td>4.7</td>
<td>1.10</td>
<td>0.72</td>
<td>24.7</td>
<td>1.16</td>
</tr>
</tbody>
</table>

Two important situations emerge: The contrasts between Japan, Singapore and Hongkong, with among the world’s highest densities of telephone lines and cellular phones and countries such as Indonesia and Philippines is quite apparent. China and India account for just 12 per cent of the wealth and telephone lines, but have two-thirds of the region’s population.

In many Asian countries, television is often more accessible than telephone services. China and the Philippines have more than seven times as many television sets as telephone lines, while Indonesia has 11 times as many. The pace of proliferation of television sets is faster. With greater use of modes like teleconferencing and video cassettes, even for the school level education, Asia is certainly ready for more tele-education.

Creating a Virtual University in the Asian context would continue to be a vision for a large number of Asian countries. Technologies such as audio cassette players, television and VCR, even through familiar to the students, constitute essentially leisure and entertainment media and till such time as sustained efforts are made to reorient these technologies for instructional purposes, these may not be adequately used as such.
Access to personal computers, modem, and domestic TV, telephone and VCR for the learners in most of the Asian countries may not be feasible for years to come. Even for a country like India, the projections spelt out on page 16 seem to be too optimistic.

To conclude, whereas in years to come more tele-education for Asia, creation of Virtual University, although no longer a part of science fiction, would take time coming.

Notes
1. Gurukuls were essentially residential boarding schools, mostly away from urban centres, where education was imparted by the teachers living in the gurukuls, through close interaction. This practice is now steadily eroding. Guru Shishy parampara was the traditional mode of teaching where the pupils stayed with the teacher, mostly as a part of the family and the later would impart knowledge and insight into the particular discipline. This mode of teaching still continues, though fast disappearing as a standard practice.
3. Outlook (1996) Vol. II, No. 27; An other recent article in India Today recounts the experiences and joy of three persons pursuing their studies for Ph. D. degree at Punjab University, Chandigarh at the age of 70 years.
6. Vikram Sarabhai was responsible for heading India in a technological direction. He stressed the importance of leapfrogging obsolescent technologies. He was the driving force behind the first large-scale attempt to use a communication satellite for direct TV broadcasting. Arthur Clarke has discussed in detail the views of Vikram Sarabhai in his article, New Communication Technologies and the Developing World (Media Asia (1981) Vol. 8, No. 4) and reproduced in the AMIC Silver Jubilee publication, Opening Windows, Issues in Communication.
7. Binod C Agrawal (Ph. D. Wisconsin) is responsible for conducting social impact studies of various programmes of ISRO. He has written extensively on the SITE experience. Dr Agrawal is presently Director of TALEEM Research Foundation. TALEEM — Transnational Alternate Learning for Emancipation and Empowerment through Multimedia.
8. Doordarshan is the National Television Service of India and also one of the largest broadcasting organisations in the world. From a modest beginning it has now grown to be network of three National Channels, two special interest channels, nine regional languages channels and an international channel. It operates through a network of 781 terrestrial transmitters of varying powers to make available the TV signals for over 86 per cent of the population. Doordarshan programmes are now watched by 270 million viewers in their homes. (Mediascape'97).
10. Gopal Sankscena is currently Director, Commonwealth Educational Media Centre for Asia (CEMCA). He has authored a book, *Television in India, Changes and Challenges*.


13. Personal Discussion with Prof. M. B. Menon, Chairman NOS and the write up supplied by him.


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