2.3 Reaching the Unreached in Networked Society
Through Networked
Education System
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Abstract

IT-haves and IT-have-nots may be a new divide that the IT revolution is creating—a divide that in effect is an (invisible barrier) between those who know and those who do not know. While in India we are facing underdevelopment and poor quality of life for large sections of society the issue before us is how the strengths of open and distance education system can be exploited to face the problem of education for all, particularly the unreached. The conference talk then describes the strengths and weaknesses of open learning system and the fast changes IT is undergoing today and the resultant emergence of networked society. On the other hand the major issues faced by the unreached are described. The experiences in Maharashtra in creating a model for networked resource-based learning have been elaborated with its six basic components of connectivity, content, competencies, learning services, research and development, and 'glocal'. The concluding note looks at programmes, (issues) of implementation and the role of open universities.(B7 = LA)

1. INTRODUCTION

It is my proud privilege to have this opportunity of welcoming you all to this Conference of IDEA 2000.1 would like to sincerely thank our host, Professor A W Khan, the Vice-Chancellor of IGNOU and all his colleagues for hosting this Conference and giving us the opportunity of meeting. The hosts are to be complimented for their foresight and deep understanding of the Open and Distance Learning System in choosing the theme of the Conference. It reflects their concern in reaching the unreached through Open and Distance Education.

We all here share their concern particularly when we are in the process of formation of Information Age. The Information Technology (IT) revolution is going on. The problem is that this new communication technology enabled society is going to create a new class of IT-haves; and all the disadvantaged are likely to form another class of IT-have- nots. Since knowledge is the driving force of the Information Society, IT-have-nots will be the knowledge poor and will not be able to participate in the new development and empowerment processes.

The problem becomes acute, since India, a developing country, is already facing Himalayan problems of poverty, illiteracy, underdevelopment and poor quality of life of large sections of society. The concern is therefore to identify the approaches and practical means to enable common man to participate in and benefit from this revolution. Our greatest issue is how can we exploit the strengths of the Open and Distance Education System and adopt newer ways and means to face the problem of educating all, particulary the unreached.

2. OPEN LEARNING SYSTEM- STRENGTHS AND WEAKNESSES

During the last one and half decade the Indian Open University System has developed into a major and well-recognized component of higher education. It covers nearly 14% of the total enrollment through its 9 state open universities and 62 distance education institutes led by the Distance Education Council and IGNOU in the functions of coordination, promotion and academic support. The strength of the System lies in:

- High quality self- instructional materials developed in various disciplines and subjects.
- Multi-media products and the use of distributed classroom in supporting print-based learning.
- Increasing use of IT and Interne t for imparting distance education.

The open universities, I believe, have established substantial lead over formal universities in use *of* media, Self Instructional Materials (SIMs) and a competency and system of pooling the best of experts and expertise from all over the country. AU these factors will no doubt help in giving leadership in transformation of the existing system of education into a new paradigm appropriate to the Information Society. I may like to point out some weaknesses of the open learning system, some of which, I believe, are common to all formal universities. The structure, processes and working culture developed by open universities have been adapted from the UK Open University and formal universities. They were considered essential for acceptance, esteem and equivalence of the products and degrees of open universities. To me they are likely to become constraining factors in the fast changing society. It is a historical fact that such systems create inertia, develop vested interests and does not allow transformation easily. We need today the organizations and structures that are open, capable of adapting and fast changing in response to the changing needs and aspirations of the society.

Another constraining feature is the concept of tertiary level education adopted in the open universities. The education on the whole is fragmented horizontally into various levels of primary, secondary and tertiary. The concept of an Open University was to give education to mature adults. Very few open universities have developed programmes that will offer access to less educated/illiterate persons who have learnt and matured from the University of Life. Pleasant exceptions are the programmes of training in Panchayat Raj and skill training of construction workers and tannery workers. The last one was implemented in Tamilnadu, where I am told even illiterate persons obtained IGNOU certificates after quality testing.

The educational model adopted by open universities is based on learning achieved mostly from study materials in print; learning process is still reading, remembering, understanding and answering the questions in the final exams, and the goal is getting a degree or diploma. Whole process of learning and its goals need drastic change. We have yet to go a long way in developing a university system with full autonomy to students, and in linking education with life and work processes.

3. THE CONTEXT OF 21ST CENTURY

Our perspective of emerging society is of networked society. Various economic and social activities are now getting transformed on Internet. Institutions, organizations, groups and individuals are announcing their presence on the World Wide Web by putting their websites. Internet is being used for commerce, business, banking, marketing, governance etc. Various local services and information are coming on the websites. We are moving towards a system of living and working wherein most of the tasks could be performed from home. Education To Home is slowly becoming a reality through Information Technology (IT) use.

There are many IT features that will be automatically changing various living and working processes when we start using IT extensively. The distances are vanishing and process of globalization is uniting the whole world. The middle persons and agencies are slowly getting eliminated and the sources of information and products are coming in direct contact with the users/customers.

The IT is developing at a shockingly fast rate. The computing, broadcasting and telephony are converging on Internet platform. Internet is emerging as the sole vehicle for all types and channels of communication. Fast development in IT industries will enable us to have better and more intimate dialog in near future. Wireless communication is enabling people to connect anyone from anywhere anytime.

All these fast changes are transforming every activity into a networked one. Education will also be networked. The convergence will enable us to eliminate the differences and distinctiveness of modes and types of delivery of education. One can now visualize convergence of formal, non-formal and informal education. The stream of distance education we created with so much of efforts and expectations is likely to loose its distinctiveness in the form and functions; and the present structures are likely to be outmoded soon. They will need replacement or radical transformation.

Emergence of Networked Society will need different basic skills and competencies to be acquired by every citizen (netizen!) in the Information Age. The basic set of skills and competencies proposed for the literacy and functionality program are given in the Appendix. The process of formation is more like a phase transition rather than a transformation. Knowledge-wise the society will have higher capabilities and potential. Value-wise the new society will have different and permeating set of values such as equality, transparency, decentralization, cooperation, democracy etc. which are linked with the basic nature of the Information &. Communication Technology (ICT).

4. MAJOR ISSUES OF UNREACHED

Major issues faced by the unreached are of access, affordability and sustainability with respect to IT facilities and its use. With 40% illiterate, 35% below poverty line, many belonging to economically and socially backward classes of society, access to IT by the unreached people and places is extremely crucial. Further the expertise in installing and maintaining network - related equipment is equally important since it is concentrated in urban areas. Major population of the unreached and disadvantaged are in rural areas.

Existing approach of percolation theory will not help in bringing the unreached in the mainstream of transformation process. This will need a radically different approach to reach the poor and disadvantaged.

5. NETWORKED RESOURCE BASED LEARNING MODEL

Let me now present the model being experemented in Maharashtra. We have proposed a model of network based education: Networked Resource Based Learning. At present we are working for two Projects:

1. Maharashtra Higher and Technical Education Network
2. Maharashtra School Education Network

Both the projects are at the pre-launch stage and we hope that they will be launched by June 2000.

The mission of the Projects are to Integrate in a self-sustainable manner IT education and IT enabled education, and in the process, create a new paradigm of education in Maharashtra, circumventing the emerging divide between the info-rich and info-poor.

The goal is to prepare learners for the knowledge-based society, champion life-long learning and stimulate the creation of world-class educational resources through IT.

In the project of higher and technical education we have to cover 1442 colleges, 132 polytechnics and 347 Industrial Training Institutes, 10 lakh students, and 50 thousand teachers. Nearly 600 colleges out of 1442 are in rural areas.

The school education Project aims at covering 14000 high schools with 80 lakh students all over Maharashtra. This includes higher secondary schools. A pilot project will start in Pune district for about 850 schools.

The model consists of developing a Network, named as YASHNET- the Maharashtra Education Network- connecting all the main partners who will be managing the Network and educational and technology providers and users. In case of Network for higher education the main partners are the State Government and universities, other partners will include Internet service providers, institutions providing IT training such as YCMOU, Advanced Computer Training School of the C-DAC and other education, information and technology providers. All colleges and educational institutions will be the members of the network and will help in delivering the content. Every provider and member of the network will announce its participation in the network by its website. Networking is essentially a partnership building exercise for mutual benefit by creating win-win situation.

The content on the Network will be educational resources, essentially on e-media and will be delivered through CDs, servers and services. The services will cover all administrative, managerial and academic services. The content is to be designed so as to promote basic learning processes for developing competencies necessary for a learner to face successfully the problems of life and work.

In order to make the network supplementary and complementary to the existing educational institutions as well as to provide alternative path for education to many outsiders, who need a second chance of education, we have identified six basic components of the networked model of education.

1. Connectivity

Connectivity is for linking all partners and colleges, institutions, organizations and individuals through Internet and Information Communication Technologies. The program of connectivity is to be developed through three stages:

Connecting colleges, institutes and universities. Each institute is expected to create LAN with Network Access Center (NAC) facilities consisting of Computer lab and a classroom with a LCD projector facility all connected through Internet. The NAC should have enough facilities to offer IT education and IT enabled education to all the students of the college. The colleges having the requisite facilities and website will be admitted to the membership of the network.

Connecting classrooms- this will be done essentially through educational programmes by creating total system of web based education to support classroom education in colleges/institutes.

Connecting individuals at home/community in a new paradigm. This last stage will need evolving a new paradigm of education which will have educational environment created through individual and group learning activities. These activities will be linked with working processes and supported by learning tools and technologies appropriate for individual and group learning.

2. Content

The content will include all that is communicated between and among learners, teachers and managers of the colleges, universities and all the partners on the network. The content will be organized into three types:

1. Core content related to a prescribed curriculum of a course. It will be developed on e-media by using appropriate pedagogy and high quality standards of multi-media and made accessible to the learners on CDs and servers.

2. **Supportive content** essentially to broaden and deepen studies of the curricular content. It could be in the form of a e-library, CDs and other materials. It could also be web sites and collected info on server to support studies of a student.

3. **Enrichment content** essentially offered by industries, professional **bodies** and R&D institutions and other organizations linked with the application of the discipline. The object is to make student well informed in various applications of the knowledge and avenues of working in subject of his/her liking.

3. Competencies

We consider that developing learning skills and competencies is the basis for lifelong learning, particularly when new paradigm of education and networked society is getting evolved. It will be essential to identify the skill-set and competencies necessary to learn a subject / discipline and create curriculum and content essentially for developing the competencies. Since IT education offers a new opportunity to apply the model we are developing the content by identifying the competencies. (Refer Appendix)

4. Learning services

Panels of best teachers and experts not only from the universities in the state but also from India and abroad will be prepared and their services will be made available to all the students in the colleges who are member of the network. The panelist will answer the questions of the students, offer seminars and workshops to students in special topics of their Interest, lead special Interest groups and generally guide the students in the discipline. They will also advise the universities about the changes and reforms necessary in the current syllabus of the subject. It is expected that the syllabi of the subjects will be modified and reformed in the light of the student feedback and expert recommendations after every cycle of implementation.

Learning services will be offered at the global and local levels. The local teachers and experts will help students more in face-to-face situation. The purpose of their services will be to personalize/customize education and learning; and make it relevant and effective to groups of learners and individuals.

5. Research and Development

This component is for developing studies and research programs for IT enabled teaching and learning, and to help accelerate the process of transformation to the new paradigm. This will involve development of new products and services, learning tools, techniques and environment, systems, quality assurance and maintenance mechanism, etc. Development of competent research personnel is also an important task and should be accomplished through web based activities.

6. Global

In the process of globalization development of international relations with similar institutions and organizations is essential for catching up with the developed nations. We have adopted in the model a convergence theory for integrating formal, non-formal and informal education.

Main approach is to ensure partnerships of related institutions and organizations with mutual benefits and a new culture of working -integrating academic and corporate culture with accountability. We propose to have the Directorate of Higher and Technical Education, Universities and colleges, ISP-ETH Research Lab, ACTS of C-DAC and Commonwealth of learning as the main partners in the Project for the higher and technical education.

6. THE PROGRAMMES AND IMPLEMENTATION

The major programmes proposed are:

  i.   Establishment of the YASHNET
  ii.   IT literacy and functionality for all.
  iii. IT enabled programs- product development and distribution.
  iv.   Learning services- organization and management.
  v.   Supportive developmental work.

The programme of establishment of YASHNET with access centers in all colleges and institutions will need for higher and technical education finance of-about Rs. 500 crores (Rs. 20 lakhs per college with 500 students); and yearly maintenance and operation cost of afocnit 30% of the total capital investment. Rural colleges will need jubodit Ra 120 ciores. The Hon'ble Minister for Higher Education, Govt, of Maharashtra has made it clear that the State Govt. Is not in a positkm to support the capital investment in this IT program. The Govt, will allow non-salary grant to be used for IT maintenance and operations. The initial investment, therefore, has to be obtained from society, industry, economic organizations and private agencies/ individuals. The Govt, may allow commercial use of physical facilities of the college; and college can have an agreement with an industry or financial institution for establishing NAC for which the Department of Education can be a guarantor. The NAC could be used for students during working hours, and for commercial use during the rest of the time.

I think that this is a good approach and allows college management to take initiative not only in establishing IT facilities but in using it for getting income to support operations and upgradation of facilities, besides giving opportunity to the staff and students for earning while serving/learning. In fact students and the college will get acquainted with working culture and situations that will help students in choosing their future careers.

Development of content is the most difficult and time-consuming task. From our experience of open university system, we know how difficult and complex is the task of bringing experts together from diverse disciplines and help them produce self-instructional materials with a time bound delivery. In the web-based delivery the materials has to be basically in a multi-media format, and expertise in IT is mostly outside the academia. The pace of development of IT is so fast that the technology and tools, and in some subjects even content are likely to be outdated within a couple of years which is the time required for developing the SIMs (Self-Instructional Materials). The content has therefore to be developed more with corporate work culture.

Electronic content is often copied easily and therefore not many private agencies have entered in the content production. The Govt. and society has to put in initial investment. The approach has to be to offer content nearly freely and recover development and operation costs through value added services such as learning support, formative assistance, achievement testing and certification etc.

The content of 100 academic-year-program will have one-time cost of about Rs. 40 ccores and recurring cost of maintenance and reform of about Rs. 10-13 crores (25-33%) yearly. The learning services will need about Rs. 10 crores per year. Additional expenditure will be required for R&D and' global linkage activities. All these add up to an amount of Rs 500 per student per year.

We are proposing creation of a mechanism to carry out all the development and distribution of educational products and services in cooperation with universities and related outside agencies. The mechanism will be lean and thin, will have virtual nature, and will work with corporate culture. It could be a non-profit company, corporation or a virtual institute. The approach is to exploit the talent, innovative nature and entrepreneurial capacities of our young graduates, and fast developing IT industry in making this happen. Simultaneously the mechanism offers universities and colleges, as partners in this program, an. opportunity for changing, transforming and! raising quality of their products and services.

7. REACHING THE UNREACHED

The State has the responsibility of supporting the weak and disadvantaged. The State/Central Government can support the mechanism by many ways. Some of these are:

i.   Use of funds from Depts. of Social Welfare, Rural Development, Industry etc to establish NAC in disadvantaged and rural colleges.

ii. Levy IT tax on all educated persons, institutions and industry; and use the fund to establish IT facilities in rural areas.

iii. Use the rural NAC for all the training and education of village level functionaries.

iv. Develop the NAC as a Community Info and Learning Center and use it for various Govt. communications and functions.

v.   Ask the economic institutions such as cooperative sugar factories, milk dairies, rural banks, marketing societies etc., in rural areas to support establishment of NACs in rural colleges and schools. These institutions can use NACs for record and communication of their village level operations.

Converting a college and school NAC into a Community Learning and Info Center will make the center self-supporting and sustainable. It will also help in linking education with society.

The State should allow the colleges to generate resources and use it in offering affordable access to the poor and needy. Earning while learning is also a way to support the disadvantaged to pay for his/her education.

8. ROLE OF OPEN UNIVERSITIES

Educationists and educational institutions are getting an opportunity to mould the new generation into a new IT culture of Information Society. Knowledge forms the basis of all future development; and educating is the way to gain knowledge. These days the educational programs are being marketed globally. Educational products and services are treated as commodities. The ICT is enabling the universities from the developed countries to sale their brand degrees in developing countries. The fees charged are very high, not affordable to a common student. This also poses a great challenge before Indian universities- a challenge to transform, to acquire cutting edge and to compete in the global market, preferably with a different model of education.

Open Universities in India have generated substantial intellectual, educational and financial resources which could be used effectively to create web based learning. Creating channels of communication with high band-width outreach to every village is the responsibility of the Govt., and some states in India have already taken up the programme and expect to reach to all blocs, circle level places and villages with optical fiber line within the next 2-3 years. This will help in having access to high speed, broad band communication for all colleges and schools.

The major issue in developing networked education is the content creation for various degree and diploma programs. The e-media fortunately allows integration, and a degree program could be developed in such a way that it can integrate almost all the content from various universities into a single integrated curriculum; and simultaneously allow each student to have access to his/her chosen curriculum. The Open University system can host the development of the Multi-Media Instructional Materials (MMIM) and create learning materials that could be used effectively by all students of various universities. This could be offered practically free of cost to most of the students. The adoption of the materials for teaching learning purposes by a university needs approval of the university authorities, This therefore needs to be ensured by a partnership building exercise, which we propose to do in Maharashtra.

The Indian open universities should propagate a model based on development, a model in which participatory development , institutional transformation and human resource development of the personnel in the university, society and IT industry / business should have major role to play. It should not be exploitation of consumers/ learners and should ultimately lead to the social and human development.

With the participation of you all, the Conference on such a vital theme of 'Reaching the Unreached' will have fruitful discussions and useful recommendations. I wish the conference all the best success.

Appendix

IT Literacy and Functionality Courses

The three levels of IT courses would be :

i.   Computer literacy courses giving basic skills to use computer and Internet for all general functions.

ii. Computer functionality courses giving training in those skills that are essential to the learners, teachers and educational managers to carry out their functions.

iii. Special courses-

   A) relevant to the degree programmes based on some discipline that a student is pursuing, and

   B) courses in IT for up-grade path for students and teachers.

All these courses could be designed at suitable levels of certificate and diploma so that a student can study these courses while pursuing higher studies.

Competencies to be developed (skill set)

Basic Literacy Skills for beginners

i.   Writing / Textual Content creation.
ii. Drawing and Illustrations.
iii. Analyzing-synthesizing and calculating/ Tabulation.
iv. Presentation
v.   Communication.

These skills could to be developed at two levels, one for the beginners and other at the intermediate level.

Functionality-

Basic Competencies needed by a student, teacher and education manager.

i.   Learning to know
     Browsing, searching, researching, discovering - knowing.

ii. Learning to work together- (group learning and working)
     As a participant and
     As a leader/coordinator/ reporter
     In activities such as talk/lecture, seminar, tutorial, workshop,
     Special Interest Group (SIG)

iii. Learning to Communicate
     Basic and applied language skills used on Internet communication. It
     should include written, oral and video/visual communication.

iv.   Learning to teach on Internet
       Using MM tools in preparing learning materials for students.
       Using learner psychology / pedagogy in MM Instructional
       Materials. Mentoring, tutoring and guiding students.

v.   Learning to manage
       Managing learning, teaching, delivery of a course/programme,

virtual management of an Institute offering teaching, learning and evaluation services.

This is just a listing of various functions a teacher/ student/ education manager has to carry out.

Approach to the IT Courses and their levels

We propose that the computer literacy and functionality courses or foundations in IT be split into two levels - the first one for the beginners leading to a Certificate; and the second one at higher functionality level leading to Diploma in IT.

Computer functionality courses for professionals such as teachers should lead to Diploma in IT for Teachers and should fulfil all the functional requirements of a teacher.

The higher level courses could be termed as special courses, distinguishing them from the Professional courses that will lead a student to specialization in IT.