

3.4 Managing Paradigm Shift in Parameters and Benchmarks for Best Practices in Open and Distance Education

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(Source:)

Abstract

ICT is transforming the industrial society into knowledge society and developing convergence of technologies such as television, telephony and computers. Such convergence has implications on the processes of teaching and learning in Open and Distance Education resulting in the appearance of a new mode of e-education. This brings about a shift in the parameters used to decide the benchmarks. This paper will consider the emergence of this new mode. In that connection a major issue is how change of technology will affect the processes of e-education and what best practices remain independent of such change. In this paper the author briefly explains various modes of education, elaborates the ICT driven education, and enumerates the parameters of quality standards in various modes. He then describes in clear terms the paradigm shifts resulted from information technology, explains quality aspects in convergent e-education, and identifies the invariant processes and practices support developmental education. (BY: LA)

1. Introduction

I compliment the BRAOU for selecting very important theme for National Conference on "Best Practices in Open and Distance Education", Effectiveness and success of the Open and Distance Education (ODE) will essentially depend on the best practices followed while making ODE relevant to the developmental needs and requirements of a common person and community.

We are going through the transitional stage when transformation from Industrial Society to Knowledge Society is going on. Information Communication Technology (ICT) is the driving force of the changes currently taking place. Convergence is emerging as the key-process of the twenty- first century. The ICT is developing convergence of technologies such as television, telephony and computers. Use of convergent communication modes has triggered convergence of many distinct processes and activities going on in the social and cultural life of the people. The campus based full-time education, distance education and various non- formal and informal processes of education will certainly get radically affected and move towards convergence.

I have therefore changed the theme title given to me by the Conference organizers by adding 'Managing Paradigm Shift' to the sub-theme given to me: 'Parameters and Benchmarks for Best Practices in Open and Distance Education'. The existing form of Open University is based on 'Industrial Form of Education' which was relevant in the 20th century and will need radical change for remaining relevant in 21st century.

In this paper we will be considering the emergence of new mode of e-education through convergence, the basic processes of teaching and learning in ODE, that will be mode independent, and shifts in the parameters used to decide benchmarks. One of the major issues is how the processes that depend on technologies are likely to change and what are the best practices, that are mode and technology independent. The last one is model dependent and hence will invite different formulations depending on the underlying design. Our attempt will be to identify invariant processes and practices that will support developmental education - the education that will support development of living and working places and people in a self-sustainable way.

2. Modes of Education

Since independence, education systems have diversified considerably by creating dual and single mode universities. Simultaneously demand for education at professional and vocational levels is fulfilled by many small institutions and training centers, outside the conventional open and distance education system, but associated with social and industrial institutions. Various information communication means of mass communication like radio, television, news papers and journals in print form have offered informal ways of giving knowledge to readers on mass scale.

Following JP Naik, the modes could be classified as formal non-formal and informal modes of education. While formal and non-formal are well structured, the informal is totally unstructured and is taking place at every place of living and working.

Over the last two decades, non-formal contribution of open universities and distance education institutions in dual mode to higher education has grown to about 18-20 % of the total enrolment of about 8.5 million students.

The single and dual mode universities as well as conventional universities are now using ICT for various purposes. This has created a new scenario of modes of education which can be classified as follows:

1. Formal Education: Classroom/campus based education imparted by traditional universities,
2. Non-formal- Open and Distance Education: Offered by single mode open universities.
3. Mixed Mode Education: Offered by Distance Education Institutions (DEI) of traditional universities by using both formal and non-formal components of two modes.
4. ICT Based Convergent Mode: Uses Web Based Education (WBE), Computer BE, Center/Classroom BE. Some universities are using ICT and Internet extensively in education to supplement the print based /classroom based mode in formal or non-formal education.
5. Entirely WBE - E-Education : Uses Internet and WBE extensively so that teaching and learning is almost distributed.

No mode described above is going to be in its pure form in an educational institution; and in many teaching & learning processes, particularly in non-formal education, mixed mode situations will be occurring quite frequently.

3. ICT Driven Education IT Development:

- With the emergence of broadband and mobile Internet, current efforts by various Internet Service Providers (ISP) to connect all cities and towns, availability of Wireless in Local Loop (WLL), Direct to Home (DTH) technologies and with the proposed education satellite, we will be in a position to solve not only the last mile problem but will be able to give Anywhere, Anyhow, Anytime access to everyone.
- Networking is fast going on with market driven economy in various marketing, financial, industrial and communication sectors. LAN and WAN are getting established. Each one is creating its own cluster networking - Banking network, railway booking network, etc.
- In near future networks offering 2 Mbps connectivity, based on Right of Way, by leveraging on existing networks of ISPs and telecom providers are going to come up to provide voice-data-telephony multiservices. The last mile problem will be solved by offering all available connectivity solutions, namely, dial-up, ISDN, leased line, DSL, cable modem, wireless, etc. HT Madras CORDECT WLL will be employed in a viable way to reach rural areas. ISRO's proposed Educational Satellite (EduSat) will offer k-band reception all over India and connecting Anyone, Anywhere, Anytime will be a reality.

- Networking architecture is moving from cluster to grid networking. The grid computing network is the newest advancement in high-performance computing which has moved from cluster of multiprocessor server architecture to a network of geographically distributed heterogeneous desktop, server and storage resources.
- A state-of-the-art nationwide /statewide computing and network grid will provide for multi-service convergence (data-voice-video) services. It is distributed server network connected to every computer.

ICT Driven Education

The broadband Internet with grid network enables us to create educational programs that could:

- Make teaching and learning possible from Anywhere, Anytime,
- Link education - learning with life and work related processes, and
 - Develop new paradigms of education.

The issue of inclusion of deprived learners due to rural inhabitation, poverty or illiteracy (digital divide) is a task which needs special attention- political as well as socio-economic. It is however our perspective that within this decade, the problems of network access and inclusion of the last person will be resolved. This will be due to globalization processes, empowerment of common people due to extensive ICT use and the inherent virtues of new technologies that may strengthen democratic participation. In all these changes, education has to play a center stage role.

4. Mode Characteristics for Benchmarking and Paradigm Shifts

Quality standards in various modes described above are related to following parameters for their benchmarking:

1. Formal Education: Input based norms of education - related to infrastructure, faculty qualifications and experience, facility based limited admission number, single campus facilities etc. NAAC/university prescribed quality standards are mostly dependent on input and output of the system.
2. Non-Formal Education: Self-Instructional materials supplemented by A-V material, core faculty in the university for development and delivery of education, unlimited/ limited admissions (limited for professional courses) depending on the nature of study program, study center facilities and services, DEC norms for quality and standards. The norms are based on processes followed for development and delivery of instructions and evaluation suitable for offering education of the same quality to a distant learner.
3. Mixed Mode Education: DEIs in formal universities are using this for quite a long time, content and evaluation is the same for regular and distance students, study center approach is used to give learning support to students through colleges and/or study centers.

4. ICT based **Convergent** Mode : Some universities are using ICT quite extensively. (IGNOU, BRAOU YCMOU, etc.) They use Internet and satellite communication to advise and guide students, to lecture and tutor in distributed / virtual classrooms, to offer expert support through websites etc. Maharashtra Knowledge Corporation, and the Computer Literacy program of Pune University and ETHRL use Convergent Mode with paperless administration, on-line and on-demand evaluation etc. This ICT application to education will be on increase as many s/w companies have created software for virtual university campuses.
5. Entirely WBE: Professional bodies like Microsoft, Sun Micro Systems etc. are using this and offering on-line content for learning, evaluation tests/exams and certification.

In terms of mode characteristics one sees the paradigm shifts - the process of change is obviously from:

- Input - Output Based Norms for traditional campus based education with traditional processes based on face- to- face teaching. (Teacher Centric)

To

- Process Based Norms for Open and Distance Education (ODE) (essentially for development and delivery for distant learners). (Learner Centric)

To

- Interactivity (throughput) Based Norms in E-Education.
(Learner Autonomy Centric)

We consider here mainly the two mega paradigm shifts. The first one is from traditional to ODE, both essentially based on industrial models of education - mass education. The second one is from ODE to E-Education dependent on mass personalization.

Here we use E-Education to denote the shift from print based learning system to e-content based educational system in a convergent mode - E-Education in Convergent Mode which will be relevant during the transitional period. We assume that this transition will be complete when broadband Internet connectivity is available to Anyone, Anywhere, Anytime,

Quality norms or benchmarks will obviously be related to the broad transformation indicated above.

In the second paradigm shift from ODE to E-Education in Convergent Mode, quality norms will essentially be related to:

- Input Norms: teacher expertise, experience and their excellence, interactivity facilities accessible to the learners, knowledge and learning resources made available to learners, facilities for giving feedback and formative assistance.
- Process Norms: the processes for development and delivery of teaching and learning, the teaching or pedagogic models employed, learning activities and their diversity, - emphasis being

on learner autonomy, formative feedback offered, self- learning and life long learning (L-3) promoted etc.

- Throughput Norms: The interactivities promoted, the ways of analyzing and supporting individual learner in his/her development in terms of skills, competencies and functionalities, developments achieved, social and human values and character development promoted, etc.
- Output Norms: The outputs and their importance in terms of contributions to personal, social, cultural and economic development, their linkages with balanced environment, community development etc.

The processes of education could be conceived in a very narrow sense or in its broadest sense. It is therefore dependent on the goals, aims and objectives of the educational models and their designs. The efforts should be to offer multiple channels and choices for learning and achieving. This demands changes in the existing offerings from content based education to Object Based Education (OBE) and from certificate - ending education to Life Long Developmental Education (LLDE).

5. IT Enabled Transformation

The first transformation - first paradigm shift - is from teacher centric to learner centric education with well designed processes for development and delivery aimed at a distant learner. Indian open universities used Study Center approach to extend outreach of education.

A Study Center is a device of giving learning /academic support and learning opportunities to distant learners (Non Full-Time students) by replicating or by substituting some of the campus facilities-academic as well as physical - by using ODE technologies. The object, rather a limited one employed by the dual mode universities, is to allow a student at a distance to learn with the similar academic support and interactivities to achieve the learning as on the main campus. Besides this, the ODE model uses a self-learning process so that student learns with more independence and lesser reliance on teachers who, particularly the best ones, cannot be replicated / substituted that easily. Instructional Materials development and learning support systems are therefore important processes in the ODE.

While analyzing the shift we concentrate on the seven main processes and practices that will remain invariant in all modes of education namely:

Teaching, Learning, Evaluation,
Creating Knowledge Resources,
Developing Infrastructure Facilities,
Creating Educational Environment and
Managing Education.

The details of the sub-processes and the quality parameters in benchmarking are given in the Table A & B.

- From Content Learning To Object Oriented Learning
- From Course Content To Object cells and Content Cells
- From Examinations To Continuous Formative Evaluation

Educational Management

- From Education To Development Education.
- From Whole Time Education To Just-In-Time Education
- From Campus Education To Distributed Education
- From Campus Environment To Virtual Educational Environment
- From a Single Institution To Consortia of Institutions / Distributed Institutions
- From Mass Education To Personalised Mass Education

Managing Paradigm Shift in Parameters and Benchmarks...

Table A
Traditional / General Mode of Education and the parameters used in norms and standards definition

SI. No.	Main Process	Sub-Processes / Requirements	Q- Measures & Parameters for benchmarking
1.	Teaching	Lecturing, Tutoring, Demonstrating Researching Extending education	Teachers-Qualified-well selected, Work-load of teachers. Student / Teacher ratio. Minimum faculty to start a subject-department. Research facilities. Research out-put & citation index. Extension activities & nature of participation and their output.
2.	Learning	Attending lectures, tutorials, Learning in labs, fields, library	Attendance in classes, labs, field workfc library
3.	Evaluation	Formative Summative	Learner achievement-marks /grades scored. Comprehensive nature and ievel of assessment in terms of cognitive, affective and psychomotor

			abilities.
4.	Creating Knowledge Resources	Collecting Text books. Reference books, Journals, & Information services	Enough textbooks. Good collection of enrichment books -journals. Nature and quality of info services. Money spent on books and journals.
5.	Developing Infrastructure and Facilities	Physical-campus, Admin -academic buildings, Hostels, Staff quarters. Common facilities, Sports & cultural facilities, Communication facilities, ICT used.	Classrooms. Tutorial/Seminar rooms. Labs & workshops. Domain related equipment and facilities. Facilities for teachers, students and their interactivities. Funds spent in capital investments, maintenance and their budget provisions Quality of maintenance of facilities. Nature of communication facilities, investment and use. Uses of the facilities-occupancy, capacity utilization
6.	Creating Educational Environment	Organization and maintenance of curricular, co-curricular & extra-curricular activities of cultural, social and intellectual types	Nature of fit numbers participating in activities. Coverage of student & teacher participation. Budget provision - resources spent. Quality through out-put and achievements - immediate and delayed.
7.	Managing Education	Managing campus facilities, academia & support services. Managing teaching, learning and evaluation.	Bodies & Committees for various activities and nature of participation. Management systems - centralized and / or decentralized. Nature of decentralization.

Table B
First Paradigm Shift from Formal Education to Non-Formal - Open and Distance Education System

SI. No.	Main Process	Sub-Processes / Requirements	ODL processes	ODL Quality Measures & Parameters for benchmarking
1.	Teaching	Lecturing, Tutoring, Demonstrating Researching Extending education	Teaching/ tutoring In a distributed classroom & study center. Giving teaming support. Creating SIMs and evaluation resources	Teachers-domain qualified & DE trained, well selected. Work -load of teachers in terms of services offered- mass + personalised. Ensuring expert / teachers and SIMs in MM to start a subject- program. Research facilities, out-put & citation indices. Extension activities, nature of participation and their output

2.	Learning	Attending lectures, tutorials, Learning in labs, fields, library	Participating in personalised, group, cooperative and experiential learning.	Attendance in classes, labs, field work & library, Individual and group participation and its nature. Contributions / achievements of learning.
3.	Evaluation	Formative Summative	Processes of evaluation while learning, and formative feedback mechanism.	Comprehensive nature and level of assessment in terms of cognitive, affective and psychomotor abilities. Learner achievements. Marks-grades scored
4.	Creating Knowledge Resources	Collecting Text books. Reference books, Journals,	SIMs, Knowledge resources-print, teachers/experts, MM IM - for learning, enriching and developing,	Enough textbooks, good collection of enrichment books- journals. Lectures, e- instructional materials. Quality and utility of materials and their access and use.
5.	Developing Infrastructure and Facilities	Physical-campus, Admin -academic buildings, Hostels, Staff quarters. Common facilities, Sports & cultural facilities, Communication facilities, ICT used.	Physical facilities for development and delivery of education. Websites, Network, Access points study, center access with ICT facilities,	Distributed classrooms & tutorial rooms. Labs, Domain related equipment and facilities, Facilities for teachers, students and their interactivities, (established or franchised) Funds spent in capital investments, maintenance. Quality of maintenance and services. Nature of communication facilities, investment and use. Uses of the facilities- occupancy, capacity utilization.
6.	Creating Educational Environment	Organization and maintenance of curricular, co-curricular & extra-curricular activities of cultural, social and intellectual types	Real and virtual environment used for promoting / supporting and facilitating learning.	Numbers and nature - coverage, student & teacher participation, Financial provisions resources spent. Quality through out-put and achievements - immediate and delayed.
7.	Managing Education	Managing campus facilities, academia & support services. Managing	ICT use in communicating, managing, accounting and evaluating	Bodies & committees for various activities and nature of participation, Qualifications and expertise of MD/CEO .

		teaching, learning and evaluation.	performances. Quality assurance mechanisms used.	Management systems - centralized / decentralized & nature of decentralization.
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6. Quality Considerations in Convergent E-Education

In today's scenario of globalization and liberalization, quality of education has acquired prime importance. It is therefore essential to build the quality assurance mechanism and benchmarking in an integrated way in the e-education. The major processes of quality assurance and accreditation used by NAAC and DEC could be appropriately synthesized.

Table C
Main processes for making quality assessment

NAAC Processes	DE Processes	E-Education Processes
1. Instructional Mission and Objectives	1. Planning and 1. Design	1. Learning System
2. Organization and Governance	2. Development of IM and Learning Resources.	2. Learning Support System
3. Infrastructural Facilities	3. Production of IM.	3. Delivery System
4. Quality of Teaching and Learning	4. Delivery of Education	4. Maintenance Development and Production System.
5. Curriculum Design and Review	5. Learning Support Systems and Services.	5. Total Quality Management System.
6. Support Services (Library, Lab, instrumentation, comp. facilities etc.)	6. Evaluation, Feedback and Analysis	
7. Student Services	7. Maintenance, Reform and Up-gradation.	
8. Sources Adequacy and Management of Financial Resources.	8. Quality Assurance - inbuilt in the Processes.	
9. Publications & Consultancy / Extension Activities	9. Administration and Management	

Convergent E-Education will employ websites and internets for imparting distance education supplemented by Local Learning Centers located near the place of living and working of a learner.

The processes of e-education will cover:

- Registration and personalization of a learner.
- Educational Services Repository:
Messenger, Download Center, Multilingual Editor, Personal Site Builder, Discussion Forum, Expert Panel, Customer Care, Mailer, Content Management, Digital Library.
- Learning Systems:
Local Learning Center Handholding, Formative On-line Evaluation & feedback, Enrichment Content, Personal Folder.
- Educational Service Providers (ESP):
Courses provided on Portal, Course Policies and Programs, On-line Expert Learner Services, Evaluation Resources Provision and Services.
- Network Management:
Delivery Chain, Exam Chain Management.
- Learner Evaluation Management:
On-line and on-demand examinations and certification.
- Maintenance, Development and Production System:
Learner Relation Management, Administrative Services, Certificates, booklets, info brochure, CD etc. printing & delivery etc.
- **Inventory Systems for various on-line services:**
- Total Quality Management:
Management of partnerships of education & activity providers, delivery actuators, professional bodies and groups, branding institutions, etc; Feedback Analysis and Reform changes; Quality assessment and management; Continuous management and up- gradation of content and services, Technology facilities etc.

A comprehensive ETH (Education To Home) Educational **Environment** (E-Cube) has been developed by the ETH Research Lab and contains all the features mentioned above.

The Distance Education Council (DEC) has developed benchmarking for the Open and Distance Education processes; and is available in their booklets published.

We give here some sample benchmarking, which will hopefully extend the current models of distance education to suit E-Education.

□ Total Quality Management

Academic Quality of a Program

Learning Resources

- Extensive nature of Aims and Objects to link learning and working.
- Identified Media and IT Tools and ICT used are accessible and affordable to the target group.
- Teaching Models / Pedagogy proposed allows experiential learning.
- Design of the program chooses learning methods/ activities and evaluation process, which promotes experiential learning and development achievements.
- The Model incorporates Life Long Learning (L-3) mechanism.
- Quality measures and feedback ensures high quality of learning. Curriculum-Instructional Design & Content
- Content is developed on the basis of objects at various levels to satisfy the needs of learner objects.
- Objects are granulated / formed in cells and corresponding content is prescribed at various levels that do not create a gap in the learning of a student.

Academic Delivery

- High quality of Learning Resources (experts and teachers) and services are made available.
- Mechanism and services for personalization is ensured.
- Pre-Registration, During Registration and Post Certification stages are well defined at an individual and group level and services provided.
- Prerequisite knowledge and skills are well defined and mechanism to ensure that the student possesses these before starting study of the course/program.
- Learner friendliness is ensured in all the tools and techniques employed.
- Feedback is immediate and learner support is capable of handling demand for all enrichment content, guidance etc. needed by a student.
- Personal progress and achievement are well monitored and guided.
- Partnerships of teachers, experts and professional bodies are ensured to achieve quality and relevance of the program.

Similar benchmarking could be evolved in all processes of Convergent E-Education.

7. Concluding Remarks

National and social objective of the e-education in the developing society like Indian is to address the age-old problems of poverty, ignorance, underdevelopment and disadvantages. If we can use the inherent virtues of the IC Technologies, its outreach to anyone and anywhere, then, we are sure the common people could be mobilized and empowered through the democratic processes to take the people to a developed stage in the Information Age. Antyodaya with equity and justice could be the goal of new educational paradigms designed and developed for people of India.

I acknowledge with sincere thanks to my colleagues, Dr. Vijay Bhatkar for inputs in new developments and perspective in IT, and Education Group in ETHRL lead by Sunil Shirke and Shashank Hiwarkar for technology development.

I would like to express my sincere thanks to the organizers for giving me this opportunity of sharing my ideas, models and designs with you all.

Let me wish all the best success to the deliberations of this National Conference as well as to BRAOU for its success in transforming & developing education.

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