

Empowering Marginal Communities with Interactive Education Systems

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Abstract

Methodologies involving issues to empower remotely distributed communities localized with sub-standard information backbone are still in demand of imperative attention from the policy initiation level in each country. Especially, nations with constricted global Internet bandwidth, rustic social condition, not properly managed information networks, unnecessary preconditions in formulating action plans and related agenda, and the least not many exalted perseverance at the national level.

Particular attention should be given to grass-root level participants in formulating non-conventional approaches to elucidate on demand driven content by articulating marginal communities in homogeneous coherence, and at the same time emulating to multifarious conjunctures of socio-economic elements.

Efforts have been given in this paper in synthesizing contents dependent on technologies, meant for distant mode of education, and analytical approaches are rendered with synopsis from condign illustrations around the continent to develop a pragmatic repository of education system. A system of collaborative learning meant for future generations, but to be dedicated specifically for marginal communities.

Introduction

When groups of users interact intensively through some medium, they progressively constitute a community. The community feeling does not automatically emerge because groups use electronic communication, it takes a lot of time, a lot of interactions. It requires sharing goals and, whatever that means, sharing experiences (Dillenbourg, P., 2000). However, the focus of the concurrent interactive education systems is mainly evolving around the marginal communities, who are deprived of basic livelihood pre-requisites. Therefore, this has become a challenge for the global leaders to provide them with basic literacy, health and other supports to improve their livelihood. Information, free flow of information, and easy access to it, can be treated as the primary ingredient to empower the marginal communities for knowledge development.

Effective utilization of information and communication technology has lead the educators to avail means of innovative methodologies to reach out the learners at the outskirts of education belt. Initially intended for dropouts, or residuals of the under-developed society, the distant mode of education, at its concurrent Diaspora, is no longer lies within, but, has achieved overwhelming success in consolidating the core stakeholders of the society.

Extending the conventional norms of learning processes towards interactive and collaborative learning; physical networks towards virtual communication platform; point-to-point connectivity towards multi-point interactive connectivity; stand alone data warehouse towards inter-connected distributed repositories, a homogeneous backbone of education system can be realized (Rahman, H., 2003(1)).

When community information centres are supposed to act as a crucial tool for human development, community users are urged to cultivate and adopt a critical attitude towards the

usage of information. Justifying the source of information they may evaluate, analyze and adapt information and knowledge for their own perspective, economic, political and social conditions. This process of justification of the content and source of content forms the basis for changing and transforming the community.

Rapid human development programmes depend on the formation of a robust civil society. Community members develop their capacity by integrating information and knowledge into the various development activities. Such capacity empowers people to solve intelligently the problems that exist in their community and eventually transforming them into valuable assets of the society.

Among the contemporary global challenges, ICT development remains as one of the important component and the following table shows its effects in different sectors. A UNESCO report quote is provided in the following Table (UNESCO 2002):

Sectors	Possible interdisciplinary responses
Education	Developed essential skills and uses ICT for improving educational access and quality
Science	Makes use of ICT for capacity building through virtual universities
Social Sciences and Humanities	Uses ICT for information dissemination on social issues
Culture	Facilities access to ICT for use in cultural resource management
Communication and Information	Promotes development of national ICT policies

Increased networking among education institutes, research organizations, and eventually government and non-government agencies to establish interactive information exchange platform, by sharing knowledge and expertise in formulating effective governance, knowledge networking and mass information dissemination at grass root level would enhance the development processes (Rahman, H., 2003(2)).

Collaborative learning system has been becoming largely dependent on ICT based dissemination processes. Some familiar and mostly used techniques are:

E-groups- the simplest one way mass dissemination technique (sometime creates spamming);

BSS- the oldest platform of common consequences (not interactive);

Moderated e-discussions- popularly adopted in recent days to reach at generic consensus utilized in researches to generate reports, create research documents, reach any consensus;

Virtual seminars- similar to the previous one, but, can be made more interactive through web-techniques and utilization of recently developed utilities.

This system of learning can provide an alternate teaching and learning solution by leveraging new and emerging, simple and scalable technologies, with the potential to simultaneously reach out thousands of learners at the same time, crossing the geographical boundaries.

It is important to use a delivery methodology that combines online instruction (content-learner interaction), a network of tutors (educator-learner interaction), and off-line course

content (in the form of CD-ROM to allow self-learning). It is also crucial to use technology not deter participants from both peer-to-peer collaboration among the learners and actual field-based application of the learning sequences.

Methodologies

It is vital that in an education system, the learners should be able to deal with real-world tasks that require problem-solving skills; to integrate knowledge incorporating their own experiences, and to produce new insights in their career. Specially, the learners and their instructors should be able to handle a number of challenges before actual learning starts; make themselves resourceful by utilizing their own strengths, skills, and demands by maintaining self-esteem and clarifying by defining what has been learned, how much it is useful to the society and how the content would be effectively utilized for the community in knowledge building.

There are several critical issues that concern the effectiveness of a design methodology and of the actual implementation plan for a collaborative and interactive learning system. Issues concerning the skill development of the learners by exploiting the technology and become active members of an online (as opposed to a traditional face-to-face) collaborative learning community need to be fulfilled. Further to these, they should be able to adapt to a constructive approach in the learning processes, participate in joint activities, amplify their abilities to cope with different kinds of information, organize themselves through knowledge development, share it with others more effectively, and satisfy their demands and objectives by participating in well-organized and coherent omni-directional discussions. After a multi-dimensional development tier, it will be easier to obtain more understanding about the dynamics of collaborative learning sequences, and develop better and robust methodologies and models.

A distributed learning platform facilitates learner-centered educational paradigm, rather than tutor-centered system, and promotes interactive learning, where the learner can initiate the learning processes. In distributed learning every learner must have easy access to network infrastructure and Internet. To support it, the network should be robust at high traffic and diversified data flow. Interactive multimedia based courseware sometime demand extended bandwidth, which is often difficult to satisfy in developing country's context, where high speed data is still not available to most of the consumers. To suffice this problem, off-line interactive multimedia CDs are becoming popular (Rahman, H., 2003(3)).

In distributed learning every learner must have easy access to network infrastructure and Internet. Emphasis should be given to collaborative learning processes, by actively sharing information, ideas and problem solving methods among a team of learners, and jointly assessing the outcomes.

Research on the development of such systems (representation of the knowledge of the domain, architecture of the system, users interface) needs to be built around the analysis of how the system supports the teacher in the process of "scaffolding" the learner's progress. The goal is to define a methodology of conception allowing the model of three topics: knowledge needed in order to assure an operative computational dialog, synthesis of the learner's actions and productions in a learner's profile, presentation of these analysis on the screen. These descriptions concern the prototypal of activities, the interactive modality, the

linguistic analysis of the learner's productions, the comments provided, since mistakes are identified (Cornet, E., 2001).

Networking can be divided into two forms; Physical networking and Virtual networking (Figure-1). Physical networking is infrastructure dependent, while Virtual networking is being superimposed over the available infrastructure. Virtual networking should adopt low cost or open source software utilities to form a common platform of communication among geographically distributed locations. Based on this concept educators are availing the facilities to form groups and dissemination hubs through email, e-groups, BBS (Bulletin Board Service), virtual seminars and moderated discussions.

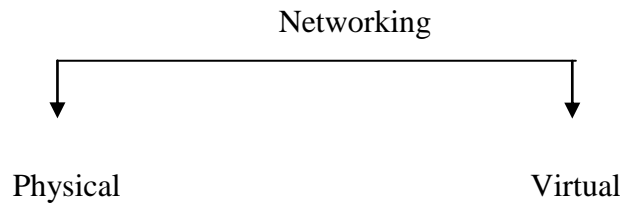


Figure-1. Forms of Networking

Available technologies can be integrated to form low cost information provider. Utilizing interactive distance education techniques, educators and learners can be brought together in common collaborative platform to make the system cheaper and easily available to marginal community users.

Access to tertiary education can be viewed as the opportunity for enrolment in education system as sustained enrolment in society development processes through appropriate education programs. These accesses include features of openness to heterogeneous environments, supportiveness to diverse clientele and relevance in diversified offerings. Success in tertiary education is also a multi-faceted term which measures the extent of achievement in national educational goals. It is also indicative to the efficiency and quality measures, like lessening of session jams, lowering of illiteracy rate, improvement of socio-economic condition and enhancement of knowledge networking.

To improve local access to the Internet, the Telecentres can assist to organize the community participants. In extended form they may comprise of business community, development agencies, students, health care workers, and civil societies. This can create

- partnership development;
- partners in learning;
- act as knowledge resource centre; and
- assist in community access programmes.

By improving the availability of information and use of ICT services in rural and remote communities, plus fostering the associated skills and consequential opportunities, to:

- expand the scopes for employment and endeavor, and
- enhance the competence and confidence of the broader community, through the utilization of relevant information and the delivery of services (including education and capacity development programmes) identified by the community as relevant to their particular needs.

When developing support services and resources for the marginal communities, the following key objectives to drive outcomes of accessibility, flexibility, peer support and independent learning should be taken care of. They should:

- provide participants with a comprehensive range of services and resources, preferably within a web based environment;
- integrate the web environment with the existing networking facilities for knowledge networking and peer support;
- address the peer support needs of remote and possibly global participants;
- provide links to other agencies and external sites acting as a one stop shop of resources, links, and support for remote participants;
- ensure accessibility of all content (including web sites) for all users;
- provide specialist resources, support and information for participants with any disability;
- develop self learning materials and resources on basic skills, education, health, and put them in an on line repository; and
- introduce and mobilize the learners/participants to the development activities and make them self expertise.

Approaches

There may be several possible approaches to empower the remote and information flow congested communities with development perspective. Most of the country's ICT strategies give high priority to an enabling policy environment at the national level to facilitate development of this sector. Mainly the education sector makes extensive use of ICT, and distance education programmes at all levels are increasingly important elements of the education strategy of a country.

The social and human sciences sector recognizes the importance of information dissemination and continues to support activities in this area, including use of ICT. Similarly, there is great potential for the culture sector to apply ICT in mobilizing grass roots support for heritage conservation, cataloguing cultural resources, promoting cultural industries, sharing information on culture through an Internet data base, using distance education techniques for training cultural resource managers, and developing public cultural education programmes through web sites (UNESCO, 2002).

An effective and efficient learning system can be established through necessary policy reforms, sufficient logistic support and capacity building. It has been recognized globally that the achievement of a country's educational aims mostly relies upon the development of effective policies and strategies with improved planning, analysis, and research.

The South Asia and the sub-continent are diverse in socio-cultural aspect and necessitate policies based on principles of multi-culture and multi-social issues. However, recent trends of ICT initiatives have resulted in forming uniform platform of coherence in many fields and aspects. This has formulated a single-minded focus on the development perspective to act in

unified resonance in many sectors. Among many, the following three approaches are described to enhance capacity building and knowledge networking among the marginal communities.

Community Telecentre Approach

Multipurpose community telecentre (MCT) may seem to be a new concept and sound complicated for many communities in developing countries. While harnessing technologies for the ultimate purpose of the community development and being advocated worldwide, communities may be brought under the sunshine at this stage. A MCT can act as the technology hub allowing a community to establish many programmes and services by providing social, economic and information technology support, in addition to being acting as the interactive learning dissemination point.

Telecentres can do much more than to provide people just the “demand of the market” access to the Internet. In fact, the use of networking technologies is the ultimate stage of the process of informal learning and technological diffusion. Once someone has mastered the skills and developed the determination to utilize the Internet, they are at the edge of a learning process which provides them with skills and utilities to be largely self-directed in their use of ICT.

Telecentres are supposed to provide much more than the Internet. Telecentres are the focal point for the diffusion of skills and access to tools associated with formation of the Information Society. Simple access to the Internet assures only that those who already know how to use the computing and telecommunications devices and know the value of information will have access to an additional resource. Telecentres assist in bringing many more people to this point of personal information capacity development.

Open University Approach

Computer mediated communications make the teaching and learning process independent of time and space. The commonly used distance education tools are: printed materials, electronics materials, teleconference, videoconferencing, radio, television, facsimiles, e-mail, newsgroups, the Internet, on-line chats, specialized software, etc. (Murshed, M.M., et. al. 1999).

There are a few distance educators, who can be designated as the leaders, in providing distance education for many years. Open University of United Kingdom, Open University of Hong Kong, Indira Gnanthi National Open University of India, Sukuthai Thamathirat Open University of Thailand, Bangladesh Open University of Bangladesh, Allama Iqbal Open University of Pakistan, Open University of Sri Lanka, are a few to name as initiators in establishing distance education platform for open learning system.

Conventional University as Added Catalyst

Many highly reputed international universities like, Adelaide University, Athabasca University, Carnegie Mellon University, Deakin University, Keio University, Harvard University, McGill University, University of Wisconsin, etc. are a few names in traditional education system, who have adopted learning processes in open and distant mode.

Through organizational approach, the Commonwealth of Learning (CoL), International Centre for Distance Learning (iCDL), and International Council for Open and Distance Education (ICDE) are serving purposes of furnishing a common platform of meeting specific needs for open learning community. However, a repository of contents, specially, in regional form is still in non-existent.

In traditional education system, Asian Institute of Technology, or Asian Institute of Management are excellent contributions from the society. But, similar approaches are missing for an open learning system. A regional institute can provide logical supports to transform this form of information warehouse into a regional open learning repository.

Case Studies

During recent years many governments, development agencies, and knowledge networking partners have evolved successfully around the globe. A few successful cases have been described to illustrate the utilization of Internet and related utilities to empower the marginal communities.

Jamaica adopted necessary policy in their national ICT policy. It is quoted below:

The Minister of Education, Youth and Culture will develop a type of “Marshall Plan” to educate all sectors in the society, retrain the ICT workforce to use modern programming languages, and broaden the ICT curriculum offered by the universities, colleges, and technical and vocational schools (Jamaica IT Plan, 2002).

Bangladesh, established a distant education university with a view to serve the marginal communities: The university Act, directs its objective:

to expand all levels of education, knowledge and science by a diversity of means, including the use of any communication technology to improve the quality of education and to provide opportunities for education to the general public through mass-orientation of education and to create efficient manpower by improving the quality of education in general (BOU Act, 1992).

Similarly the Bangladesh Government has recognized that, information infrastructure need to be upgraded to advocate the formulation of a national data bank towards the development millenium initiatives. Their ICT Policy refers:

3.2.25 A central depository for collection and dissemination of ICT information and research findings will be developed. This will be done under a network, connecting all university libraries and research organization to this central depository, which in turn will be connected to the Internet (Bangladesh ICT Policy, 2002).

As a global representative, UNESCO adopted ICT initiations in their policy:

1.2.1.3 Developing information and communications technology (ICT): One of the driving forces of globalization is the privileged gathering, commercial exploitation, and sharing of new knowledge and information through information and communications technologies. However, for many people and nations, especially the poorest in the region, access to the new knowledge dynamic is denied by the absence of scientific and technological capacity. Separated by a digital divide, found both within and across countries of the region, those without ICT will suffer as their access to new knowledge declines, their income-generating skills become outmoded,

and their ability to compete in a globalizing environment diminishes. Meanwhile, the social transformation stimulated by globalization is disorienting and disempowering for those seeking to maintain the meaning of their lives according to local cultural expectations.

1.2.1.4 Bridging the digital divide is a social, technical, educational and cultural challenge, in particular bringing affordable ICT access and content to the unreached (e.g., the remote and “unconnected” rural poor) and ensuring that they have the skills to participate (UNESCO, 2002).

A few cases are given below:

Case 1: A Virtual Schooling service (VSS) Pilot Project was established by Education Queensland in 2000. The project sought to test the feasibility of flexible delivery of senior secondary school curriculum to students using online audiographics technology via the statewide telecommunications infrastructure, namely the EDNet. An evaluation of the first phase of the project revealed that all of the participants had to face new realities while creating the virtual school. The VSS project managers needed to ensure that the delivered courses met the approval of accrediting and certifying agencies. The VSS teachers were required to create teaching and learning programs delivered both synchronously and asynchronously, in a new technological environment, as well as develop skills in "classroom" management with no visual contact with students.

Case 2: Deakin University, Australia, a leading provider of distance education, is committed to the development of leading edge technologies to facilitate its on line teaching and learning facilities and environments. It is critical to the development that Student Support Services as a major provider of academic support services to students and staff, provides a rich variety of on line resources and support to compliment and enhance the system.

Case 3: The United Nations Online Network of regional Institutions for capacity Building in Public Administration and Finance (UNPAN) is a virtual electronic network promoting exchange of expertise and sharing of experiences and lessons learned in public administrative and finance.

Case 4: The International Virtual Education Network (IVEN) is a joint project of the IDB, Brazil, Argentina, Colombia, and Venezuela, to develop multi-media mathematics and science teaching materials for upper secondary schools.

Conclusions

The emergence of enormous discrete repositories of learning materials will necessitate new capabilities for storing, caching, searching, filtering, retrieving, and managing digital information among geographically distributed servers. The system should be able to expertly cope on creation of content, storage and management, search, query and filtering techniques, wide distribution and easy access, and management of content right.

The community must able to identify and discuss their development problems on their own, so that they become capable to demand further information by themselves. Linking of information needs with community development activities allows the community to collectively process and add value to the information, content and knowledge accumulated from different sources.

Interactive learning systems deserve sound financial planning and management to ensure its sustainability. In many cases, developing countries find that funds are not available to

continue a distance program after donor funds are terminated, so it is important that initial investment be accompanied by adequate funding for recurrent expenditures.

Initiating and sustaining an institution-wide redesign of education will require strong executive leadership and a viable process model, because it entails fundamental rethinking of instructional strategies (Diana G. O., & Mark K. M., 1994). Designing a revitalized learning experience needs hard thinking, understanding of core values of thoughts, and effective changes in long-established instructional patterns.

The amalgamation of three existing information networks in the region-ASTINFO, RINSCA, and RINSEAP-into the Asian and Pacific Information Network (APIN) can assist in forming a common knowledge platform.

To be a successful knowledge network, it deserves:

- sound management by a highly committed committee;
- all out support from the community;
- mass awareness of the community; and
- opportunities to serve the local demand.

The most common factors for a successful of telecentre, are:

- the capabilities of the coordinator, the management committee and the community people;
- the entrepreneurship, and flexibility in the management and operation;
- business creation and service delivery covering much wider range than would be possible in the locality or region; and
- the ability to be responsive and adaptable to local conditions.

This form of learning system can only build on a set of basic computer literacy skills and serve as a factor in motivating digitally illiterate individuals to pursue computer literacy education, while serving as a vehicle for deepening advanced computer literacy skills.

Due to lack of appropriate paradigm, there is no definitive networking approach yet to the designed to operate under a sound virtual collaborative learning methodology. However, approach to bring new expectations and changes in the attitudes and remuneration structures for both the learners and the knowledge provider with different pedagogic and learning methods, technical and training supports can build up versatile social structures, encourage effective learning and develop critical thinking skills at the marginal community level.

References

Bangladesh ICT Policy, 2002. National Information and Communication Technology Policy, Ministry of Science and Information & Communication Technology, Government of the People's Republic of Bangladesh, October 2002.

BOU Act, (1992), BOU Act 1992, No. 38, 3(5).

Cornet, E., 2001. Service Telematique et Communication, ULB- Rapport STC on the 20th World Conference on Open Learning and Distance Education, Dusseldorf, 2001.

Diana G. Oblinger and Mark K. Maruyama, 1994. Distributed Learning, CAUSE Professional Paper Series, #14, 1994.

Dillenbourg, P., 2000, Virtual Learning Environments, University of Geneva, 2000, a report on Virtual Learning Environments.

Jamaica IT Plan, 2002. A Five-Year Strategic Information Technology Plan for Jamaica, Government of Jamaica, March 2002.

Murshed, M.M., Karmakar, G.C., Rahman, S.M. and Rahman, M.H., A Computer Mediated Teaching and Learning Scheme for Bangladesh Open University, A Proceeding of 11th International Conference of the Information Resources Management Association (IRMA2000), May 21-24, 2000, Anchorage, Alaska, USA.

Rahman, H., 2003(1). Virtual Networking: An essence of Future Learners, a conference proceedings of the *International Summer Meeting of the Laboratoire de Modelisation et Simulation Numerique en Mecanique*, July 7-9, 2003, Marseille, France,.

Rahman, H., 2003(2). Formation of a Knowledge-Based Society through utilization of Information Networking: Perspective Bangladesh, a proceedings of the 1st International Workshop on Networking Technologies, December 17-18, 2003, Bangkok, Thailand.

Rahman, H., 2003(3). Distributed Learning Sequences for the Future Generation, A proceeding of the "*Closing Gaps in the Digital Divide: Regional Conference on Digital GMS*", February 26-28, 2003, Asian Institute of Technology, Bangkok, Thailand.

UNESCO, 2001. Teacher Education Through Distance Learning, Summary of Case Studies, October 2001.

UNESCO, 2002. Medium-term Strategy for the Asia and Pacific Region, UNESCO, July 2002.