Report

of the

Evaluation Committee

on

NMEICT

The Committee Members

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Acknowledgement

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Disclaimer

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Contents

1. Background

Using Information and Communication Technologies (ICT) for imparting education is a disruptive innovation with a great potential for changing the education and learning scenario in the country. As a nation, we need to create a framework to harness and manage this innovation for creating equity of reach and access for the benefit of the citizens in a manner that transcends both space and time. This advantage of the use of ICT as a medium for diffusion of knowledge and creation of vibrant learning communities would be a valuable national objective. For keeping the diffusion curve consciously upwards, several steps have been envisioned and initiated. For this purpose, Government of India through its Union Ministry of Human Resource Development (MHRD) in February 2009 during 11th Five Year Plan had launched a Mission titled National Mission on Education through Information and Communication Technology (NMEICT) with a budgetary allocation of Rs 4612 crores.

The Mission Document prepared for initiating this programme informs the backdrop and objectives of NMEICT. The text begins by envisioning India as an emerging *knowledge* superpower. It also puts forth a proposition that India, a nation with second largest population in the world, has enormous demographic diversity and capacity, which if utilized effectively has the ability to leverage the nation to a *knowledge superpower* status. The Mission Document also identifies some of the present lacunae which are likely to become impediments in the effective use of ICT. The desiderata remain free and open access to quality learning.

1.1 Objectives of the Mission

The objectives identified by the Mission Document are reproduced below. (Appendix 1 provides a link to download the complete Mission Document)

1. Effective utilization of intellectual resources, minimizing wastage of time in scouting for opportunities or desired items of knowledge appropriate to the requirement.
2. Certification of attainments of any kind at any level acquired through formal or non-formal means in conventional or non conventional fields.

3. Any-time availability of desired knowledge at appropriate levels of comprehension to all for self paced learning.
4. Platform for sharing of ideas and techniques and pooling of knowledge resources.
5. Systematically building a huge database of the capabilities of every individual human resource over a period of time.
6. Scholarship / Talent management including identification, nurturing and disbursement electronically.
7. Nurturing of scholars and learners.
8. Support to all the learners / workers for any of their perceived learning needs.
9. Extensive leveraging of the advancements in the field of ICT for taking the knowledge resources to the door steps of the learner.
10. Capability to handle the user base which would ultimately be expected to cross 50 crore in the long term.
11. Use e-learning as an effort multiplier for providing access, quality and equality in the sphere of providing education to every learner in the country.
12. Provide for Connectivity & access devices, content generation, personalization & mentoring, testing & certification and encouragement of talent.
13. Bringing efforts of different interested agencies working in the field of e-learning under one umbrella and establishing logical linkages between various activities.
14. Capacity building in this sphere and utilizing dormant capacities of various organizations. Creating infrastructural facilities for long term utilization and making sustained efforts for content generation & connectivity including access devices production.
15. Encouraging research in spheres covered by Mission activities. Creating a large number of networks of experts in various fields to carry forward the gigantic vision under this Mission.
16. Providing e-books & e-journals, utilizing the repository of contents generated so far and the automation of evaluation processes. Creating a high impact brand for e-Journals in leading disciplines with a provision for good incentive-based payment to the researchers publishing their high quality papers in these e-Journals.
17. Spreading Digital Literacy for teacher empowerment and encouraging teachers to be available on the net to guide the learners.

18. Multi-lingual content development for the learners more comfortable in those languages.
19. Voice support for educational material delivery and interactivity for the content on the portal.
20. Development of interfaces for other cognitive faculties which would also help physically challenged learners. These efforts may cut across all the content generation activities.
21. Conversion of existing educational tapes into indexed formats compliant with the internationally accepted standards such as SCORM (Sharable Content Object Reference Model).
22. Launching a national movement for content and question generation.
23. Development of GIS (Geographical Information System) based resource inventory as a knowledge base (for subjects and skills where ever possible / feasible) for educational and planning purposes.
24. Improving teachers' training and course curriculum.
25. Providing Digital/Information Literacy for teacher empowerment.
26. Creating a clearinghouse cum rating agency for various web based learning contents for guiding Indian learners.
27. Establishing a credible rating institution for knowledge content available on the Internet utilizing the large expert base, which would get collaboratively networked through one of the sub Missions of this National Mission.
28. Preparation of metadata and timed index preparation for educational video / audio content on tape or other media.
29. Credit based flexible module formulation for openness to qualifications and easy transfer of credits from one programme / course to another.
30. ERP (Enterprise Resource Package) and e-Governance for education.
31. Development of pedagogical techniques based on edu-entertainment.
32. Customization of Open Source Tools etc.
33. Development of robust models of networking to encourage community participation at local levels.
34. Content delivery through EduSAT and narrowcasting of TV signals. Providing 1000 DTH (Direct to Home) channels on 40 transponders [to be availed through the

Department of Space] so that a separate DTH channel is available for every subject for every class in various languages to the extent possible.

35. Development of DTH platform for EduSAT and cheaper equipments for two way connectivity through satellites.
36. Providing e-Learning support to every higher education institution for technology assisted learning.
37. Setting up virtual labs and lab centers and finishing schools for quality enhancement.
38. Development of cheap access devices to make them affordable for every individual.
39. Making broadband affordable for every learner.
40. Developing reliable identification systems for learners and examiners and also developing model testing centers to test the learners under controlled environment.
41. Developing very low cost, low power consuming wireless mesh [Institution of Electrical and Electronics Engineering (IEEE) 802.11 standard or better] or point to point long range communication [IEEE 802.16 standard or better] robust video servers to act as communication and computational hubs at educational institutions.
42. Development of devices for achieving convergence among connectivity technologies.
43. Standardization & Quality Assurance of e-Content.
44. Facilitating development and deployment of ultra low cost physical tool kits for engineering and science students to encourage project and design based learning complementary to the e-learning.
45. Deriving lessons from our ancient knowledge base.
46. Reducing ill-effects of internet / web based learning.
47. Guidance to learners through various psychological / personality tests.
48. Coordination and synergisation of knowledge related activities of different Ministries and organizations.

1.2 Salient Features of the Mission

To realize the objectives outlined above, the NMEICT Mission identified key areas of work. Salient features of the scope of the Mission as abstracted from the Mission Document could read as the following:

1. SAKSHAT portal, "One Stop Educational Portal", SAKSHAT, with intelligent navigation techniques is to take care of all needs of the entire learning community by extensively utilizing e-learning concepts and ICT based methodology. The portal would provide one stop access to all the generated contents, all services provided by the Mission and will be the interface between the Mission team and Project Investigators (PIs). Many educational services like scholarships, testing and certification, student / scholar / teacher / institution ratings, guiding demand and supply of talent through opportunity surveys and forecasting, etc. are expected to be delivered through this portal.

2. Encouragement to be provided to intellectual agencies, Non-Government Organizations (NGOs) or Government Organizations (GOs), to contribute to the growth and development of portal by way of creation and uploading of content on the portal. Maintenance and coordination related activities in respect to the portal may be entrusted to a Government body for which the Mission is to provide financial and technical support.

3. The portal is to be designed to provide content in different formats. Besides the provisioning of content in the form of video lectures, portal is to provide access to e-books & e-journals, through controlled / authenticated access links to virtual laboratories and audio / video tutorials, etc.

4. To avoid reinventing the wheel, the already available content on tapes and other media is to be digitized and indexed in accordance with various subjects and the disciplines. In this context of leveraging already available content, an earlier initiative of National Programme on Technology Enhanced Learning (NPTEL) is already in its second phase

and has been making its e-contents available through its website http://nptel.iitm.ac.in. These resources would also be eventually delivered through the SAKSHAT portal.

5. Mission is to device appropriate mechanisms to ascertain quality of such contents being developed. The Mission is to undertake the services of experts to evaluate the content and provide credible ratings to the contents and its developers. Quality assurance for e-learning content and evolving standards for content creation, delivery and management is to be done. Any R&D in these areas is to be supported by the Mission.

6. Mission is to encourage and facilitate the setting up of virtual labs, lab centers and finishing schools, so that the learners in the distance education system and those in remotely located educationally backward areas may reap the benefits of quality and relevant education, through ICT.

7. Mission is to support the endeavors in regard to the dissemination of contents in the form most suitable for the learners. Accordingly, the Mission is to encourage development of language conversion toolkits, developing suitable pedagogical mechanism keeping in view the varying intellectual calibers, etc.

8. The Mission is to support building of a knowledge network among the institutions of higher education and seamlessly integrate with National Knowledge Network (NKN) to make free availability of the content. To achieve such a massive connectivity, all possible options such as Internet, Intranet, Satellites (EduSAT and others), Narrow casting TV signals, Direct to Home (DTH) platform, etc, are to be explored. In respect to the connectivity, following are the key components:
    a. Communication & bulk storage servers at 100 institutions
    b. EduSAT teaching hub at each of the 100 Central Institutions
    c. 2000 nodes for 1 Gbps connectivity, at each of the 100 Central Institutions, to be connected through BSNL Internet + VPN Plan

d. EduSAT Satellite Interactive Terminal at each of the 18000 Institutions of Higher Learning
e. 15-20 nodes for 7.5-10 Mbps connectivity at each of the 18000 Institutions of Higher Learning connected through BSNL Internet + VPN
f. 6 up-linking hubs for 6 National Beam transponders of EduSAT Plan
g. Provision of 1000 DTH Channels for Eklavya & other video based programmes including IPTV for e-learning
h. Provision of 100 PC in 18000 Institutions of Higher Learning @ 1 per faculty member on 50:50 cost sharing
i. IPSTAR satellite access device @ $250 per device for 100*300+18000*5 = 120000 terminals but limited to 1/10th of this number for North-East only.
j. Bandwidth Charges for IPSTAR

9. The Mission shall provide these connectivity options at highly subsidized rates. The State Government educational institutions and private educational institutions are expected to contribute 50% of the cost of hardware and 25% of the cost of connectivity/bandwidth charges. The availability of funds for competing these activities is estimated to be as follows:

Activity	**Provision under the Mission from Central Government**	**Contribution of the State Government or private institutions**	**Total availability**
Hardware	700	700	1400
Connectivity	1000	300	1300

(*all figures in crores*)

Table 1.1: Connectivity Budget Estimate

10. Mission is to undertake a mass movement for teacher empowerment and digital literacy. To realize this endeavor, Mission is to help Governmental and Non-Governmental agencies launch massive campaigns to spread digital literacy for teacher empowerment so that they can use the computer and access e-devices that are necessary to browse through e-content and the world of knowledge available in cyber space and spread education among the masses.

11. In order to reap the benefits of ICT enabled learning to the learners, the Mission is to encourage and support research for achieving technological breakthrough and innovations for development of very low cost and low power consuming access devices, authoring tools for contents, development of software, navigation tools, and new technologies for creation of virtual laboratories and other electronic means for facilitation of e-mode of distance education. The research areas would also include IPTV (Internet Protocol Television), edu-entertainment, technology for education, lifelong learning environment, digital library for e-books & e-journals and evaluation & examination systems, etc.

12. The Mission is to facilitate and support setting-up of a testing service for certifying the skills acquired by the learners through formal and/or non-formal means. The Mission is to devise a reliable system for identification of learners / examinees and examiners. Efforts to create testing centers for testing of the skills /competence/capabilities of examinees under a controlled environment is to be supported by the Mission. Support for devising a system of ongoing development and enriching of the question banks, with the involvement of experts and teachers from all over the country is to be provided by the Mission.

13. The Mission shall also facilitate sharing of high cost resources (software as well as hardware) available at various institutions with a view to improving their capacity utilization.

14. From a human resources perspective, Mission is to support maintenance of a massive repository of academicians, experts, scholars and agencies.

15. Besides above, few other supportive endeavors of the Mission are enlisted below:
    a. Development of software controlled hardware programming for robotics.
    b. Adaptation and deployment of open source tools.
    c. Development of unified ERP systems for educational institutions.
    d. Development of vocational educational modules.
    e. Providing coaching for economically poor students.

1.3 Mission Operation and Financial Status

The Mission was launched in Tirupathy, Andhra Pradesh on 3rd February, 2009 in Sri. Venkateshwara University by the then Minister of Human Resource Development (HRD). In order to facilitate the operationalization of the Mission, the following three Committees were formed as reproduced from the Mission Document, namely:

1. Apex Committee: It is chaired by the Minister of HRD with members as Secretaries of Expenditure, DOT, DIT, HE, SE&L, Planning Commission and representatives from UGC, AICTE, IGNOU, CBSE, NCERT, NCTE, DEC, Directors of all IITs, IIITs, IIMs, IISc, VCs of Central Universities and Directors of anchor institutions. It is to play a pivotal role in policy making, formulating guidelines and creation of all other Committees.

2. Project Approval Board (PAB) / Empowered Expert Committee: It is to ensure implementation of Mission's objectives through various teams in best possible manner. It is chaired by the Secretary (Higher Education), MHRD, and renowned experts from academia and industry, and representatives from Department of Expenditure, DIT, DOT, DST and Planning Commission.

3. Domain Experts Committee / Standing Committee: It is to act as a backbone providing technical support. It is responsible for continuous evaluation of new project proposals, providing recommendations for sanctioning of projects and periodic review of sanctioned projects.

The activities and follow up of all the Committees is supported by an administrative wing set up by the Ministry of HRD (MHRD) known as Mission Secretariat. All documentation, coordination and day to day support among all the above Committees are to be provided by the office of Mission Secretariat.

The Mission has been operating with invited / nominated members to the Standing Committee which has been screening all the major project proposals. A large number of projects have been sanctioned and where the quantum of money proposed by the Principal Investigators (PIs) has been high (more than 20 Lakhs), the Standing Committee has been recommending uniformly a *pilot scheme* (not exceeding 20-30% of the budget proposed) to be demonstrated in a short period. In the cases where pilot projects have been assessed to be reasonably well done, the PIs have been requested to scale their proposals to a full project by submitting a Detailed Project Report (DPR). Several of these are also reviewed by experts invited by the Mission office. In the cases where reviews where favorable, the Standing Committee presented the project proposals to the PAB for full sanction.

The Mission began with a Budget outlay of Rs 4612 Crores during the 11th Five Year Plan. The budget estimates, revised budget estimates and the actual expenditure for the four financial years since the start of the Mission as given by the NMEICT Directorate are tabulated below:

Financial Year	**Budget Estimate (BE)**	**Revised Estimate (RE)**	**Actual Expenditure**
2008-09	502.00	502.00	361.01
2009-10	900.00	300.00	270.88
2010-11	900.00	500.00	459.31
2011-12	943.00	400.00	380.03

(*all figures are in crores*)

Table 1.2: Financial Status

1.4 Formation of Evaluation Committee

In order to evaluate the overall efficacy and effectiveness of the NMEICT and its functioning, its achievements against stated objectives, and to provide comments and suggestions for improvement, the MHRD constituted an Evaluation Committee vide letter no. 16124/2010/Tel dated 27th June, 2011 with the following members:

Prof. Goverdhan Mehta	National Research Professor, University of Hyderabad.	Chairman
Prof. Vinayshil Gautam	Emeritus Fellow and A Al_Sagar Emeritus Chair Professor, IITD	Member
Prof. H. P. Khincha	Professor (Retd.) and Advisor, IISc, Bangalore	Member
Mr. Rajendra S. Pawar	Chairman, NIIT	Member
Prof. D. K. Bandyopadhyay	Vice Chancellor, Guru Gobind Singh Indraprastha University	Member Secretary

The terms of reference for the said Committee, as outlined by the MHRD are:

(a) To evaluate the extent to which the following objectives of the ongoing NMEICT scheme have been met so far:

(i) Content Generation under NPTEL, for Under Graduate and Post Graduate courses;
(ii) Provision of e-books and e-journals free to learners;
(iii) Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning;
(iv) Development of language converter and translation tool kit;
(v) Development and realization of Virtual Reality Laboratories and supporting facilities for e-learning;
(vi) Spread digital literacy for Teacher Empowerment;

(vii) Experimentation and development of ultra low cost access devices for wider coverage of learners and their field trials;

(viii) 'Talk to Teacher' as a substitute for coaching for the economically deprived students;

(ix) Adaptation and deployment of open source simulation packages equivalent to MATLAB, ORCAD, etc;

(x) Development of unified ERP system for Educational Institutions;

(xi) Development of Vocational Educational modules and use of haptic devices for education & training;

(xii) Connectivity to Universities and Colleges.

(b) To ascertain whether there has been or could be commensurate social impact due to implementation of NMEICT Scheme;

(c) To assess the adequacy of e-contents for science and technology sector and social sciences sector. While doing so, clearly distinguish between recommendation for these sectors;

(d) To assess financial and other requirements for the second phase of the Scheme keeping in mind the objectives;

(e) To assess whether the norms provided under the NMEICT scheme need revision;

(f) To suggest improvements, if any, in the NMEICT scheme;

(g) To suggest measurable criteria for the NMEICT's success and future course of action;

(h) To ascertain whether the projects undertaken so far as (i) in the right direction (ii) are progressing at the right pace and (iii) whether the funds allocated for them are commensurate with the tasks to be accomplished;

(i) To evaluate the processes and transparency followed in sanctioning of projects;

(j) To identify constraints in utilization of resources made available for the teaching learning community under NMEICT; and

(k) To see whether the scope of NMEICT should be extended to include school education also, and if so, how?

2. Methodology and Organization of the Report

The paragraphs below outline the approach adopted in undertaking the evaluation process of NMEICT. It, inter alia, gives the methodology and indicates the structure of the report.

2.1 Methodology Adopted

1. Extensive desk research of similar evaluation reports in the domain of ICT in certain representative geographies of the world to identify the key indicators of evaluation processes used by them.
2. On the basis of the above, discuss the distillations informally, at peer level personnel to firm up the indicators of evaluation to be adopted.
3. Undertake field work on random sampling basis to develop an appreciation of the way the Mission has evolved through its various networks and projects.
4. Give full opportunity to the institutions / PIs who utilized the Mission funds to report their work and accomplishments.
5. Setup a closed and open ended questionnaire on the website of SAKSHAT to enable public participation by those desirous of contributing to the evaluation of the Mission programme.
6. Develop structured interactions with different stakeholders (learners, collaborators and administrators) to document unbiased perceptions of the impact factor of the Mission including online evaluation of the contents of NPTEL.
7. Provide adequate opportunities to different stakeholders including the industry, the regulators, domain experts, MHRD officials including PAB Chairperson, senior academics and anyone else who had a view to offer on the Mission.
8. Liaison with the Mission Secretariat to get their point of view on the comments and the evaluation processes as these evolved.
9. Have structured iterations amongst the Committee Members for a cogent evaluation of the Mission. As required, other participants of the process in the working of the Mission in the preceding years were also invited to participate in the committee deliberations.

10. Undertake various levels of evaluations to obtain a reliable understanding of the working of NMEICT. These include:

- **Developer's Perspective:** A two days meeting was conducted with the content developers, virtual lab developers (PIs and co-PIs), connectivity provider, SAKSHAT portal managers, virtual university concept developer, training for trainers, organizers, etc.

  A detailed questionnaire was sent to PIs so that they could present their point of view before the Committee which was also video recorded. The main features of the questionnaire were:

  - Brief of original proposal which was approved and financial sanction accorded.
  - Current status of the project along with the milestones achieved and activities completed.
  - Reviewers report, if any.
  - Plan to complete the project and proposed milestone for the remaining period.
  - Any other item deemed important for the future course of NMEICT.

- **User's Perspective:** A detailed questionnaire was designed to get the feedback from the users of the NMEICT Project (SAKSHAT portal) mainly learners, collaborators and administrators and was implemented on sample basis in Delhi to understand the impact such as i) ease of navigation, ii) user friendliness, iii) visual presentation, iv) usefulness & v) informativeness.

  Online NPTEL feedback by different users was also analyzed.

- **Expert's Perspective:** The IT experts' consultative meeting was undertaken to get the futuristic technological perspective to charter right type of technological framework to be put in place for its seamless effective uses even at the farthest corner of the country. Another consultative meeting with the experts involved in education sector was conducted to get their inputs.

- **Committee's Perspective:** A series of meetings of the Committee Members took place to analyze the findings and getting the report prepared.

The applicational aspect of this methodology is depicted in Figure 2.1.

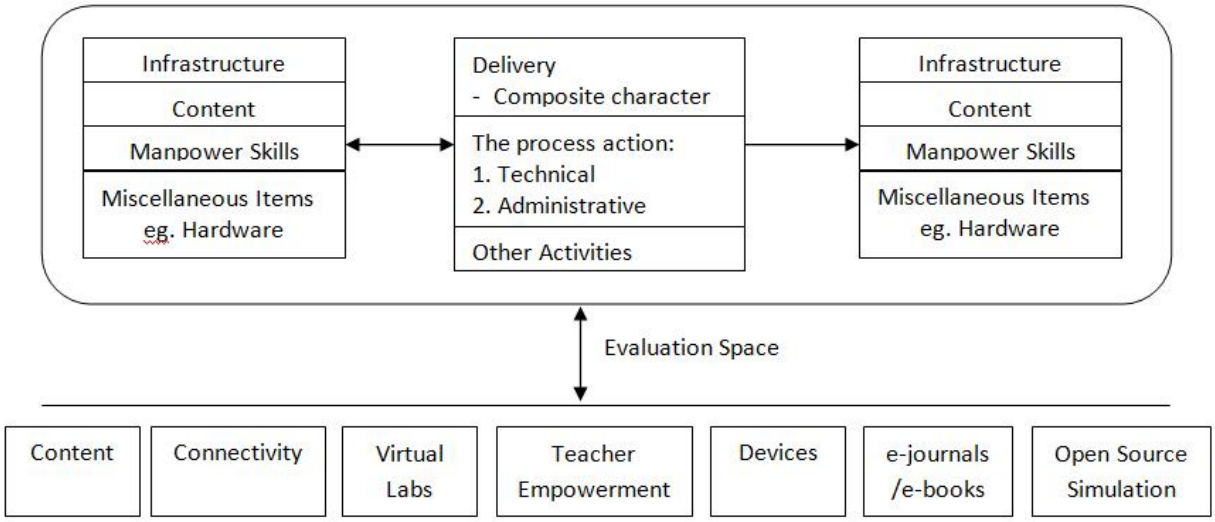

Figure 2.1: Diagram on the applicational aspects of the methodology

In order to bring greater coherence in the evaluation process, the wide ranging Terms of Reference (ToRs) of the Committee have been organized under four broad categories, namely, a) Content[1], b) Connectivity[2], c) Access Device[3], d) General and Other Services[4]

The indicative mapping of ToRs with the above categorization is given in Table 2.2.

[1] **Content**, in the context of the Committee's review includes e-content development for all disciplines at various levels (UG and PG), provisioning of e-books/e-journals, development and realization of virtual labs, development of vocational educational modules and hepatic devices, etc.

[2] **Connectivity**, in the context of the Committee's review has been envisioned as setting up a pan-India network in which all academic institutions would be connected with multiples of 10 Mbps bandwidth and universities with multiples of 100 Mbps bandwidth, subsidized by the Ministry. The Virtual Private Network (VPN) in the present context refers to providing seamless access to content without barrier to every citizen of the country, anytime, anywhere.

[3] **Access Device**, in the context of the Committee's review refers to a low cost device, robust, longer battery backup running on open source software with a wireless access for distribution to learners all over the country.

[4] **General and Other Services**, in the context of the Committee's review include supplementary activities like development of suitable pedagogical methods, research in e-learning, development of language convertor toolkits, digitization of books and journals, open source software creation and enhancement, spreading digital literacy, development of ERP system, etc.

Terms of Reference	Categorization
(a) To evaluate the extent to which the following objectives of the ongoing NMEICT scheme have been met so far. (i) Content Generation under NPTEL, for Under Graduate and Post Graduate courses;	Content
(ii) Provision of e-books and e-journals free to learners;	Content
(iii) Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning;	General and Other Services
(iv) Development of language converter and translation tool kit;	General and Other Services
(v) Development and realization of Virtual Reality Laboratories and supporting facilities for e-learning;	Content
(vi) Spread digital literacy for Teacher Empowerment;	General and Other Services
(vii) Experimentation and development of ultra low cost access devices for wider coverage of learners and their field trials;	Access Device
(viii) 'Talk to Teacher' as a substitute for coaching for the economically deprived students;	General and Other Services
(ix) Adaptation and deployment of open source simulation packages equivalent to MATLAB, ORCAD, etc;	General and Other Services
(x) Development of unified ERP system for Educational Institutions;	General and Other Services
(xi) Development of Vocational Educational modules and use of hepatic devices for education & training;	Content
(xii) Connectivity to Universities and Colleges.	Connectivity
(b) To ascertain whether there has been or could be commensurate social impact due to implementation of NMEICT Scheme;	General and Other Services

(c) To assess the adequacy of e-contents for science and technology sector and social sciences sector. While doing so, clearly distinguish between recommendation for these sectors;	General and Other Services
(d) To assess financial and other requirements for the second phase of the Scheme keeping in mind the objectives;	General and Other Services
(e) To assess whether the norms provided under the NMEICT scheme need revision;	General and Other Services
(f) To suggest improvements, if any, in the NMEICT scheme;	General and Other Services
(g) To suggest measurable criteria for the NMEICT's success and future course of action;	General and Other Services
(h) To ascertain whether the projects undertaken so far as (i) in the right direction (ii) are progressing at the right pace and (iii) whether the funds allocated for them are commensurate with the tasks to be accomplished;	General and Other Services
(i) To evaluate the processes and transparency followed in sanctioning of projects;	General and Other Services
(j) To identify constraints in utilization of resources made available for the teaching learning community under NMEICT; and	General and Other Services
(k) To see whether the scope of NMEICT should be extended to include school education also, and if so, how?	General and Other Services

Table 2.2 Terms of Reference and Categorization

2.2 Organization of Report

The report is organized as below.

Chapter 1: Background.

Chapter 2: Methodology and Organization of the Report.

Chapter 3: NMEICT Projects - Implementation Status.

Chapter 4: Analysis and Assessment.

Chapter 5: Recommendations of Evaluation Committee.

Appendices:-

Appendix 1: NMEICT Mission Document (download link).

Appendix 2: Dates and Synoptic View of the Proceedings.

Appendix 3: NMEICT Project Wise Implementation Status

Appendix 4: Percentage Funds Allocation Summary for NMEICT Projects.

Appendix 5: NPTEL Online Feedback Analysis.

Appendix 6: NPTEL Offline Feedback Analysis.

Appendix 7: Response from IIT, Rajasthan and NMEICT Mission Directorate.

2.3 Committee Meetings

The Evaluation Committee has worked through 14 meetings. (Dates and synoptic view of the proceedings are in Appendix 2).

3. NMEICT Projects - Implementation Status

In order to fulfill the Mission's objectives, the Ministry of Human Resource Development (MHRD) approved a number of projects encompassing diverse institutions in different parts of the country. These projects broadly covered most of the major areas of interest to the Mission. The approved projects were classified into two categories by the Mission based on the budget and approval processes, namely, major or large projects and minor or small projects. Projects with funding of more than 20 Lakhs were considered as major projects while those with 20 Lakhs or less were considered as minor projects.

3.1 Selection and Approval Process

The process adopted for selection and approval of projects, as provided in Mission Document, is given below:

1. **Eligibility of Institution:** Central / State Govt. institutions / research institutions, renowned institutions in a specific field (public / private), renowned NGO, any organization setup by an expert or any other institute approved by the Apex Committee.

2. **Applying Procedure:** Initial proposal to be submitted online on the SAKSHAT portal which would then be circulated electronically among the domain experts for their comments in a prescribed form. Once the proposal is evaluated to meet any one of the 48 objectives of the Mission, the concerned PI would be called for a presentation and a revised proposal if it were recommended during online evaluation.

3. **Screening Process:** Project proposals are screened by peer groups formed by Domain Expert Committee (Standing Committee) and upon its recommendations; the PIs are requested to submit a pilot project deliverable or a full DPR in the SAKSHAT portal. The Standing Committee would then recommend sanctions to the PAB for granting the project to the PI.

In many instances, due to very large variations in subject matter, technical expertise, quality of outcomes, collaboration between many institutions handling same project, etc., the PIs were also invited to the PAB meeting for providing necessary technical clarifications. Once PAB sanctions the project, the Mission Secretariat coordinates with the MHRD's Finance Wing for release of funds.

3.2 Project Implementation Status

A brief on the present implementation status of approved projects as on 31st December, 2011 as per the Executive Summary Data provided by the Mission Directorate is given in Appendix 3. The implementation status reports constituted a key input in the evaluation of the programme. For every project, information related to the following key parameters has been extracted and detailed in a tabular format (in Appendix 3):

- Project Title
- Name of Partner Institute (s)
- Principal Investigator (PI) / Co-Principal Investigators (Co-PIs)
- Deliverables (as per project Report)
- Main Project Cost
- Funds Released So Far
- Progress as on Date

A total of 49 major projects (more than 20 Lakhs) and 37 minor projects (20 Lakhs and less) have been funded under the NMEICT Mission.

3.3 Profile of Region Wise and Thematic Distribution of the Approved Projects

This section brings forth through various graphical representations different facets regarding broad domain / themes (content, connectivity, access device and other services), percentage funds allocation and region wise reach of NMEICT projects.

Details of the data used in these graphical representations have been placed at Appendix 4.

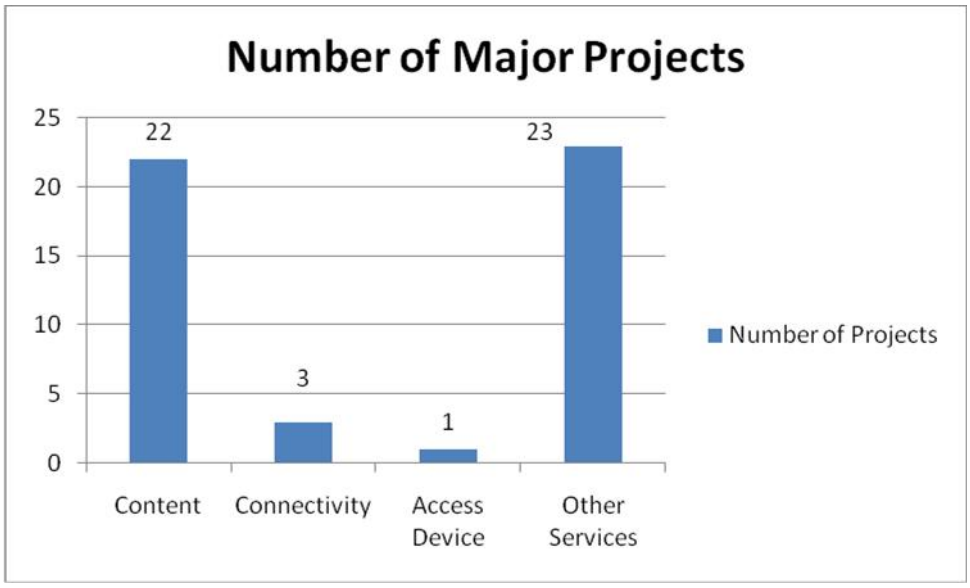

Figure 3.1: Number of major projects sanctioned under various themes of the NMEICT Mission. The preponderance of projects in the area of content is clearly brought out.

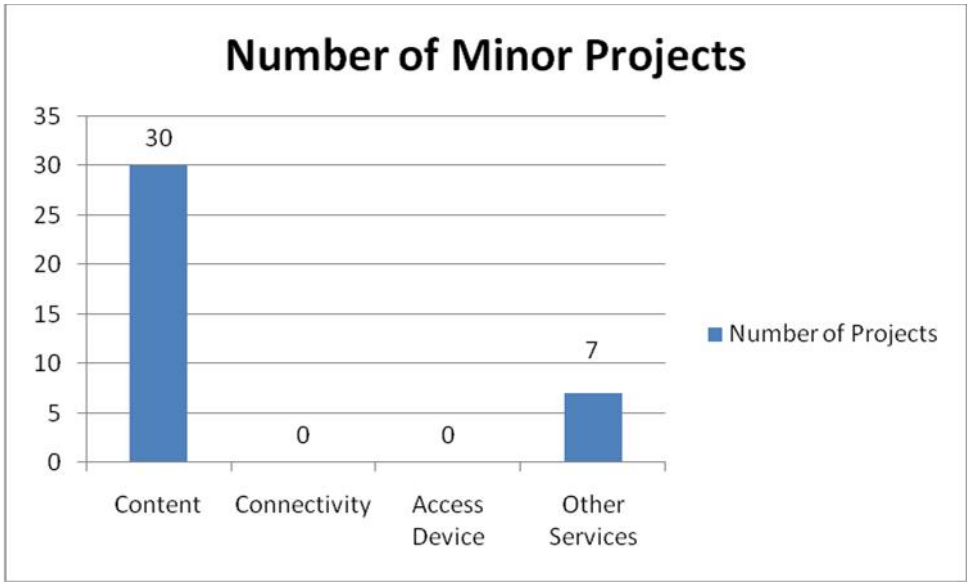

Figure 3.2: Number of minor projects sanctioned under various themes of the NMEICT Mission. The preponderance of projects in the area of content is clearly brought out.

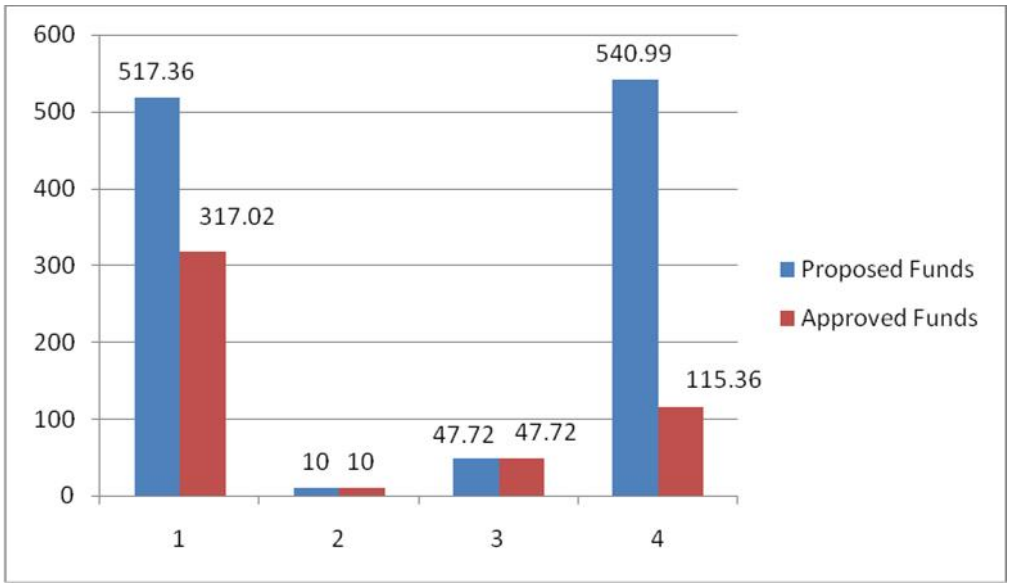

Figure 3.3: Funds (in Crores) approval status for Major NMEICT Projects indicating emphasis on content creation and a mismatch between proposed & approved funds

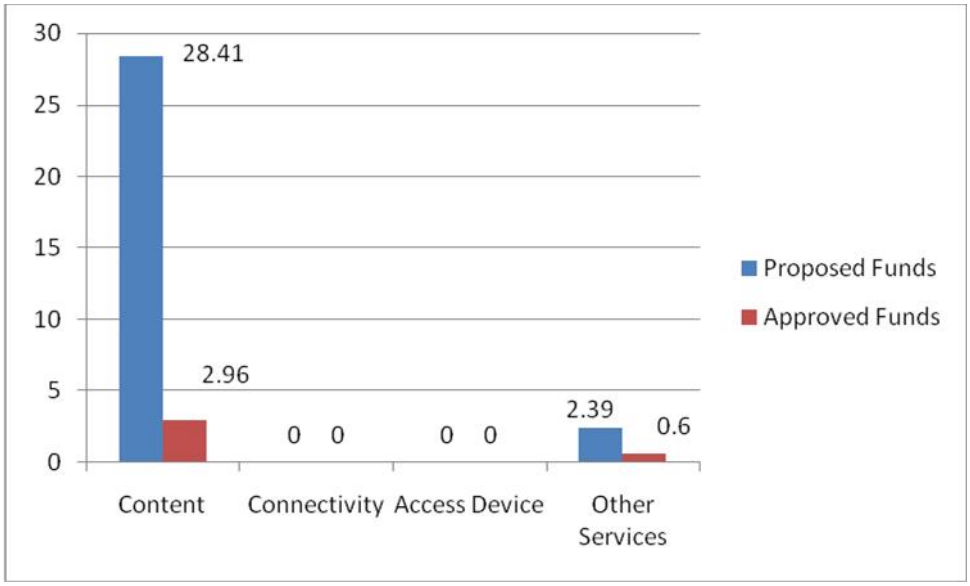

Figure 3.4: Funds (in Crores) approval status for Minor NMEICT Projects indicating a mismatch between proposed & approved funds

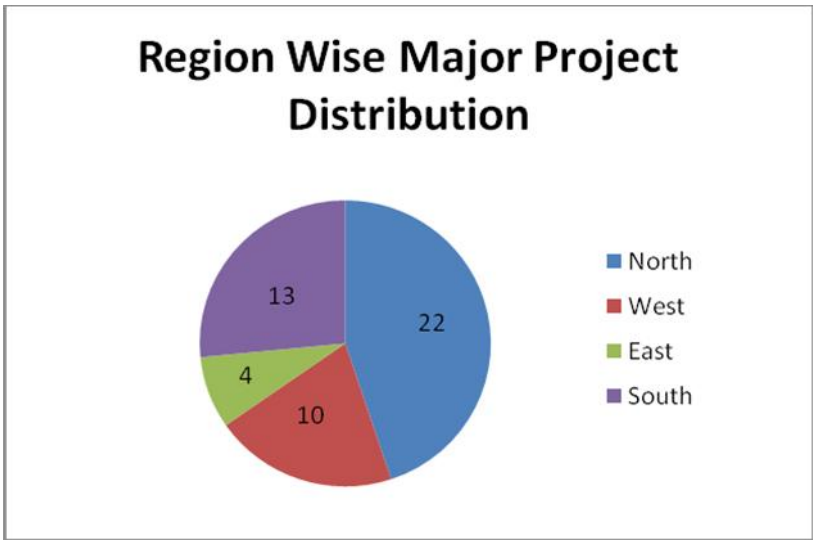

Figure 3.5: Region wise distribution of Major projects (number wise)

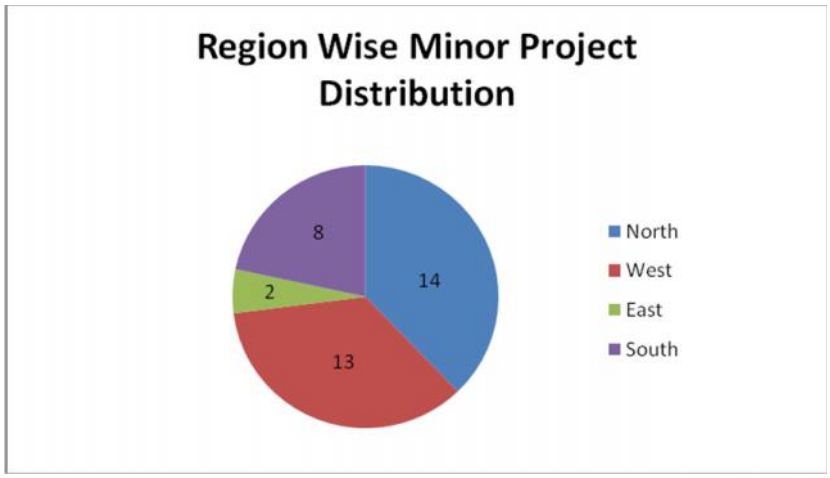

Figure 3.6: Region wise distribution of Minor projects (number wise). Better region wise spread is quite apparent.

4. Analysis and Assessment

In the context of the rapidly expanding education system in the country and the quest for creating a new and vibrant learning environment, NMEICT Mission is a timely and thoughtful initiative amongst many on the anvil. Considering the challenge posed by increasing numbers, outreach to different geographic regions and socio-economic communities, exploding diversity of academic offerings and the rising educational aspirations of the young generation, the Mission unfolds an ambition and intent to deploy technology as a key enabler for inclusive advancement of education in the country. This is in tune with the increasing deployment of ICT in education worldwide like MIT Open Courseware, Consortium of Yale, Stanford and Purdue, etc. The creation of one stop educational portal SAKSHAT under the Mission has the potential of being a game changer.

The Mission as a concept and also from a macro perspective is a sound proposition. However, at a strategy and implementation level it has faced many challenges and encountered a number of difficulties. The present assessment endeavors to identify and highlight some of them and in the following Chapter makes recommendations regarding steps to be taken to address them. While making an objective assessment of the Mission, the Committee was cognizant of the fact that in the first phase of this ambitious programme considerable effort was devoted towards capacity building, identification of key personnel and institutions, creating awareness, building infrastructure and putting processes and systems in place and therefore, outcomes had to be weighed in terms of this investment in future. In this backdrop, Committee has attempted to identify the significant achievements of the Mission as well as some of the limiting gaps and voids. These are presented under the broad categorization of a) Content, b) Connectivity, c) Access Device and d) General and Other Services.

4.1 Content

- Much of the focus of first phase of the Mission in terms of number of projects as well as resources was on content creation (including animations, virtual labs, teacher facilitation and empowerment, etc.). It may also be recalled that prior to the initiation of the Mission, the National Programme on Technology Enhanced Learning (NPTEL, 2003) had contributed

considerably towards content creation in engineering, science and management studies. This programme was subsequently merged with NMEICT Mission but continues to maintain its own identity and activities.

- NPTEL initiative envisaged creation of content for 990+ web and video courses in all major branches of engineering, physical sciences both at the undergraduate and postgraduate levels and in management studies only at postgraduate level.
- As per the information available, 600 courses are available on NPTEL website (including link through SAKSHAT portal). The remaining 390+ courses are at various levels of development. While considerable progress has been made towards the target of 990+ courses, the projected target still remains to be reached. Since NPTEL programmes are already available on the Web and there is a considerable user base, it served as a good platform for obtaining user feedback and evaluating their utilities.
    - NPTEL Project Online Feedback: A detailed analysis of web based user feedback is provided in Appendix 5. Some of the findings gleaned from this feedback are given below:
        - A large proportion of student users find the NPTEL courses quite helpful in their coursework.
        - Course content by and large match the syllabi requirements of different universities.
        - The depth of exposition of the subject is also considerable.
        - The audio and video quality though considered adequate, needs improvement.
        - Use of the NPTEL website by faculty community is comparatively low.
        - The pace of course delivery needs attention and modulation.
    - NPTEL Project Offline Feedback: Limited questionnaire based surveys were conducted in Delhi and Bangalore and a detailed analysis of the feedback is presented in Appendix 6. Overall feedback on the identified parameters was considered positive.
- NMEICT envisaged diversifying content generation in areas other than those covered by NPTEL like basic sciences, social sciences, environmental sciences, journalism, etc. The data presented in Appendix 3 indicate this activity has made only limited headway.

- The strategy to involve major agencies like UGC, IGNOU, etc. for content creation particularly in areas of Basic Sciences, Humanities, Social Sciences and Vocational Education has made little headway and there are practically no tangible outcomes.
- The programme for development of virtual labs and its productionization has shown considerable progress in simulation based experiments. However, its advance towards remote triggered virtual lab experimentation and integration with appropriate course material is still on the anvil.
- There is little evidence of any major research activity or innovation pertaining to the development of e-learning protocols and pedagogy. A programme on the development of instructional design documents and learning objects has made limited progress.
- There have been several projects dealing with isolated and randomly selected themes in content creation. However, there is very little synergy and there is need for integrating them into meaningful course content.
- Quality check (including possibility of plagiarism) in the overall process of content generation leading to the uploading on the SAKSHAT portal is not clear and needs to be recalibrated.
- Review and oversight processes to monitor projects are more oriented towards budgetary matters/allocations rather than on the rigor, quality and deliverables.
- Content on NPTEL and SAKSHAT portal is not sufficiently user friendly mainly in terms of navigational tools.
- The provision to provide support for e-books and e-journals to various institutions and universities has substantially facilitated teachers and students access to these resources.
- In overall terms, the projects sanctioned under NMEICT on content creation represent an uneven landscape. While considerable amount of content has been developed, it was noticed in some projects on content creation little or no progress has been made. This indicates that there are some systemic fault lines in the process for awarding projects and disbursement of resources.

4.2 Connectivity

It is obvious that the success of the NMEICT Mission leverages ICT technologies for learning is pivoted on the fundamental aspect of connectivity. The learning services of various forms can be

accessed only on the backbone of functioning, universal and reliable connectivity services. Any shortcoming in respect of connectivity would imply that all the peripheral services provisioned, would be rendered useless.

Government of India launched two major initiatives spearheaded by National Knowledge Network (NKN) and NMEICT to provide connectivity to the higher education institutions.

The NKN scheme involved premier institutions receiving connectivity of 1Gbps to 10 Gbps per institution. Under NMEICT connectivity to more than 20,000 degree colleges and 520 universities (20 departments in each university) is to be provided. The actual operation of the NMEICT scheme involved connectivity provisioning by BSNL (Department of Telecommunication). From the data received from BSNL, it is observed that connections with 1Gbps bandwidth have been provided to 419 universities as on 16th May, 2012 out of the targeted 499 universities and more than 18,000 colleges in 33 circles (involve both state and central universities) out of 25,000 colleges and 2,000 polytechnics targeted have been provided with bandwidth of 10Mbps.

- Considerable progress has been made in providing connectivity with reasonable bandwidth to a large number of institutions of higher learning. However, a significant number of them have remained unconnected. Given the skewed distribution of higher educational institutions presently and rapidly growing demand, it is expected that many more institutions are going to be established in future. Therefore connectivity issues need to be futuristic.
- There is a need for better dialogue and coordination between NKN and NMEICT on connectivity issues for better reach and services.
- At present there is a degree of over emphasis on wire based connectivity. This suggests imperatives for exploring other possible options to address the perennial issue of last mile connectivity.

4.3 Access Device

One of the most significant initiatives in the Mission has been the conceptualization of a Low Cost Access Device (LCAD) for universal access to educational materials. This envisaged meeting the aspiration of every Indian learner to have an Access Device at an affordable price. This conceptualization has resulted in market awareness of the need to have price sensitive

devices available to Indian and global learning communities and aroused interest from different players to come into the arena for manufacturing and distributing such devices.

The NMEICT Mission envisaged the design, development, distribution, verification and testing of such a device during this period. This resulted in the launch of the first generation LCAD christened AAKASH in November, 2011 and was expected to hit the market soon. However, there has been a delay in the procurement, testing and distribution. In this regard, the Committee notes the following:

- It was not possible for the Committee to capture the full process leading to the development and production of the device.
- The delay in implementation and setting up of testing centers in this nationally important project is a cause of concern.
- The connectivity possibilities including bandwidth availability and usage pattern requirements are critical components of LCAD to be integrated with the specifications.

However, in an effort to understand the background and process leading to the timely availability of AAKASH in the market, the Mission Directorate as well as the PI of the project were requested for their inputs. The detailed responses provided by them are placed at Appendix 7.

It is learnt that the process leading to the launch of an up-scaled version of LCAD in the form of AAKASH-2 is in advanced stage and is likely to be available soon.

4.4 General and Other Services

- Vision of NMEICT is commendable and timely. However, the translation of the Vision of ICT based education to an operational strategy could have been more incisive and focused.

- The selection and award of projects under the Mission through the process of Project Approval Board (PAB) / Empowered Expert Committee / Domain Experts Committee / Standing Committee in which some of the PIs were involved points to possible conflicts of interest.

- The administration and management structure of the Mission might have been driven by the prevailing circumstances or contingency of the situation. However, considering the highly professional nature of the Mission and its ambitious objectives, an independent, professionally managed mechanism could have been a better option.

- Absence of a suitable review and monitoring system with flexibility for mid-course corrections/readjustments has resulted in the underperformance of some of the projects.

- The Mission received a substantial grant under the 11th Five Year Plan period, but was not utilized fully (refer Table 1.2).

- There were impediments and difficulties with regard to distribution of project funds amongst partner institutions.

- Considering the size and diversity of the country, the awareness level of the Mission and the utilization of the SAKSHAT portal appears to be low.

- Given the fact that most learners are comfortable to study in regional language, availability of most of the developed content in English language only is a limiting factor.

- The digital literacy among teachers, essential for sensitizing the learners, self improvement and outreach, is an impediment for the impact of the Mission.

- The efforts of the Mission in creating free and open source software and tools to use them have made little progress.

- Supporting INFLIBNET-INDEST consortia programmes through this Mission was a thoughtful endeavor and has greatly benefited the research community, teachers and learners.

5. Recommendations of Evaluation Committee

Based on the preceding analysis and assessment (Chapter-4), the Evaluation Committee outlines its recommendations in this Chapter.

In order to contextualize and collectively provide a coherent set of recommendations, the Committee has categorized (as mentioned earlier in Chapter-2) NMEICT Mission activities under the four broad categories mentioned earlier, namely, a) Content, b) Connectivity, c) Access Device and d) General and Other Services.

The above categorization is further amplified under each of the heads to include most of the items indicated in ToR.

Content - All projects that involve e-content development for all disciplines at various levels (UG and PG), provisioning of e-books/e-journals, development and realization of virtual labs, development of vocational educational modules and hepatic devices, etc.

Connectivity - All project(s) that involve setting up a pan-India network in which all academic institutions would be connected with multiples of 10 Mbps bandwidth and universities with multiples of 100 Mbps bandwidth, subsidized by the Ministry. The Virtual Private Network (VPN) in the present context refers to providing seamless access to content without barrier to every citizen of the country, anytime, anywhere.

Access Device - All project(s) that involve provisioning of a low cost device, robust, longer battery backup running on open source software with a wireless access for distribution to learners all over the country.

General and Other Services - All projects that include providing supplementary activities like development of suitable pedagogical methods, research in e-learning, development of language

convertor toolkits, digitization of books and journals, open source software creation and enhancement, spreading digital literacy, development of ERP system, etc. The administrative, managerial, financial aspects and future directions are also covered under this head.

In order to relate the recommendations to the Terms of Reference of the Evaluation Committee, a mapping table is shown below (Table 5.1).

Terms of Reference	**Evaluation Committee Recommendations**
(a) To evaluate the extent to which the following objectives of the ongoing NMEICT scheme have been met so far: (i) Content Generation under NPTEL, for Under Graduate and Post Graduate courses;	5.1 Content
(ii) Provision of e-books and e-journals free to learners;	5.1 Content
(iii) Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning;	5.4 General and Other services
(iv) Development of language converter and translation tool kit;	5.4 General and Other services
(v) Development and realization of Virtual Reality Laboratories and supporting facilities for e-learning;	5.1 Content
(vi) Spread digital literacy for Teacher Empowerment;	5.4 General and Other services
(vii) Experimentation and development of ultra low cost access devices for wider coverage of learners and their field trials;	5.3 Access device
(viii) 'Talk to Teacher' as a substitute for coaching for the economically deprived students;	5.4 General and Other services

(ix) Adaptation and deployment of open source simulation packages equivalent to MATLAB, ORCAD, etc;	5.4 General and Other services
(x) Development of unified ERP system for Educational Institutions;	5.4 General and Other services
(xi) Development of Vocational Educational modules and use of hepatic devices for education & training;	5.1 Content
(xii) Connectivity to Universities and Colleges.	5.2 Connectivity
(b) To ascertain whether there has been or could be commensurate social impact due to implementation of NMEICT Scheme;	5.4 General and Other services
(c) To assess the adequacy of e-contents for science and technology sector and social sciences sector. While doing so, clearly distinguish between recommendation for these sectors;	5.1 Content
(d) To assess financial and other requirements for the second phase of the Scheme keeping in mind the objectives;	5.4.3 Financial requirements projection
(e) To assess whether the norms provided under the NMEICT scheme need revision;	5.4.2 A New Structure for NMEICT Mission Operation
(f) To suggest improvements, if any, in the NMEICT scheme;	5.4.2 A New Structure for NMEICT Mission Operation
(g) To suggest measurable criteria for the NMEICT's success and future course of action;	5.5 Road Ahead
(h) To ascertain whether the projects undertaken so far as (i) in the right direction (ii) are progressing at the right pace and (iii) whether the funds allocated for them are commensurate with the tasks to be accomplished;	5.4.2 A New Structure for NMEICT Mission Operation
(i) To evaluate the processes and transparency followed in sanctioning of projects;	5.4.2 A New Structure for NMEICT Mission Operation

(j) To identify constraints in utilization of resources made available for the teaching learning community under NMEICT; and	5.4 General and Other services
(k) To see whether the scope of NMEICT should be extended to include school education also, and if so, how?	5.4 General and Other services

Table 5.1: Mapping of ToR with the recommendations of Evaluation Committee

What follows are category wise recommendations of the Evaluation Committee.

5.1 Content

Contents in various forms, namely, audio/video lectures, lecture notes, tutorials, e-books/e-journals, etc. are being created and/or provisioned under various content generation projects. Besides this, opportunities for virtual experimentations have been initiated and newer avenues in this arena are being explored. Following are the recommendations in this regard:

- **Comprehensive 4-Quadrant Based Content Creation:** The Committee observes that most of the e-content generated in the present form is not fully compliant with the *four-quadrant* approach. It is therefore suggested that all content generation activities should be measured and benchmarked in full consonance with *four quadrant* approach.

  It may be recalled that the *four quadrant* approach has been proposed by one of the major NMEICT project, namely, NPTEL as part of its Phase-II activity. This approach envisages that content be prepared in the following four dimensions:-

  Quadrant 1: Content web based lecture notes / video lectures in an organized form.

  Quadrant 2: Animations / visuals / illustrations, Video demonstrations / documentaries and interactive simulations wherever required.

  Quadrant 3: Supplementary reading/Wiki Development on the course, other resources /open content in the internet, Case studies, anecdotal information, historical development of the subject.

Quadrant 4: Problems, Quizzes, Assignments and Solutions, Online feedback through discussion forums and Setting up of FAQs.

This is an appropriate model to be adopted for all content generation projects.

- **Connecting video Content with Real Life Situations:** An attempt should be made to take the video-graphic content of presentation beyond the studios in diverse locational settings and sources and also capture the real life situations. Simultaneously, attempt should also be made to embed small strips of picturized situations in video-graphic content presentation.

- **Integration of Content:** The Committee emphasizes the importance and urgent need for the integration of generated content at a common portal. At present, content creation projects in different forms are being independently pursued at different institutions. For example, NPTEL coordinated at IIT, Madras is focusing upon creating of video lectures, etc., OSCAR++ at IIT, Mumbai is focusing on creation of animations and Virtual Labs programme at IIT, Delhi is focusing on creating virtual lab experiments. However, if one views from a learner's perspective, he/she would require all these forms of content in one common place (SAKSHAT portal) as an 'integrated whole'. Therefore, it is recommended that there should be a built-in mechanism to ensure coordination and synergy in all forms of content creation so that they can be integrated and bundled together for effective use by the learners.

- **Remotely Triggered Virtual Labs:** While considerable progress has been achieved in virtually simulated experiments, more projects directed towards establishment and operation of remotely triggered labs should be supported to enable access to high end experimentation by learners in less endowed environment.

- **Quality Assurance of Content:** Being a Mission of national importance, any content uploaded as part of NMEICT should be reflective of high academic quality, measuring in standards to the best available anywhere. Therefore, it is recommended that content be uploaded on SAKSHAT portal after due scrutiny and diligence and should be of highest standards. In order to accomplish this, the Mission needs to have a rigorous and stringent

quality assurance policy on the content generation. Some recommendations to strengthen the existing mechanisms are given below:

- It should be ensured that QA testing procedures, guidelines and mechanisms are clearly defined and are made available to content developers so as to ensure quality content. To facilitate and strengthen QA capabilities, more relevant projects in this area need to be initiated.
- Evaluation Committee recommends strengthening of the present review mechanism for the content generated under the Mission both at *pre-launch* and *post-launch stage*. It should be ensured that no content is uploaded on the portal without going through a well defined review process for which a checklist should be put in place. The NMEICT needs to devise a mechanism to identify a pool of domain specific expert faculty within India and/or abroad with no conflict of interests whatsoever, who could be entrusted upon the task of reviewing the content at different stages. On the one-stop portal SAKSHAT, contents which are still under review process needs to be categorized separately and marked as "*Under Review",* whereas those which have been reviewed, the names of reviewers should appear as *"Reviewed By …"* along with the content. This would instill further confidence in the learner community that the content uploaded is indeed of high quality and validated by independent reviewers.
- In view of the fast changing landscape of learning paradigms and to maintain topical relevance, the Committee proposes that there should be a well defined strategy in place for periodic maintenance (like corrections, addition / deletion of exercises, tutorial contents, case studies, animations, etc.) and for upgrading the content (like adding latest developments in the domain knowledge, emergent topics related to a course, etc.) so that the contents on SAKSHAT portal are always up to date. In addition to the above, suitable mechanisms need to be crafted for a periodic review of the content in the post-launch stage so that obsolesce and redundancy are minimized and the material on the portal always remains relevant and topical.
- A set of guidelines for standardization of audio, video and other types of content to be loaded on SAKSHAT should be generated and followed.

- All contents posted on the SAKSHAT portal should be vetted by anti-piracy software to eliminate possibilities of plagiarism and a suitable disclaimer in this regard should be displayed.

- **Engage with the very best from anywhere and everywhere:** The Committee feels that it is essential to widen the net of content creators by engaging many more competent contributors from a wide range of institutions. It is recognized that there are vast body of scholars who are outside the formal system of education but constitute a rich resource for enriching the contents on SAKSHAT portal. It is strongly felt that scholar outside the formal system should also be involved in content development particularly in areas of creative endeavors like art, music, etc. Therefore, a massive pan-India (and even abroad) outreach exercise for identifying the available talent pool of content creators should be undertaken.

  A call for participation by experts towards content creation may be displayed on SAKSHAT. Minimal eligibility criterion and a screening mechanism for identifying content creators and reviewers may be prescribed.

  It is also recommended that orientation programme in both online and offline formats for content creators should be devised and implemented.

- **Ownership of Content and Usage Rights:** The Committee recognizes the importance for a clear policy with regard to ownership and user rights of contents generated and uploaded as part of the Mission. Committee recommends that ownership of the content be rested with the original contributor/s. All content uploaded on the SAKSHAT portal should have a suitable disclaimer clarifying that individual author/s is/are responsible for the content uploaded and that portal or MHRD is not responsible for the content posted. Since the usage rights and ownership rests with original contributor/s, a policy with regard to their use rights by individuals and organizations should be formulated.

- **Stated Deliverables for Content Generation:** The Committee is of the view that the Mission develops and mandates a strict deliverable policy on all the projects under the category of content generation. The deliverable policy must categorically outline the

compliance guidelines with respect to the 4-quadrant approach with integration processes, QA procedures, content format standardization and ownership rights.

- **R&D in Content Generation/Authoring Tools:** The Committee has observed that activity in this area is at a modest level and needs considerable strengthening. Hence, R&D efforts using open source tools for creating high quality video content, animations, e-based self learning and evaluation resources, simulators and interactive communications, etc., should be initiated / augmented.

- **Virtual Programmes in Andragogy**: Programmes in teacher certification in andragogy issues and better teaching practices needs to be created with the help of communication and instructional designs experts.

- **Special Initiatives in Humanities, Social Sciences, Arts and Other such Disciplines:** As content creation activity in some of the areas related to Humanities, Social Sciences and Arts, etc., has been deficient, there is need for launching a special drive to create quality content in these areas to enrich the SAKSHAT portal. In this regard, considerable scholarly resources which are available in the non-formal systems should also be tapped in an imaginative manner.

- **Concurrent Focus on Self Learning:** To harness the full potential of SAKSHAT as a national learning platform for all, the content creation should also concurrently serve as an enabler of self learning along with self evaluation to reach out diverse constituencies irrespective of age, time, place and pace of learning.

- **INFLIBNT-INDEST Activities:** The present practice of providing support for subscription to e-journals/e-resources through the INFLIBNET-INDEST activities should not only be continued but their budgetary should be enhanced to keep up with the present and expected future requirements. In addition, the coverage of institutions needs to be augmented and may include private institutions also. Automated framework for collecting user feedback and the use patterns needs to be put in place and should form part of overall decision making process.

5.2 Connectivity

Based upon the statistics provided in Chapter 4, the Committee is of the view that considerable progress has been made in this major endeavor. A very significant portion of the resources have been utilized for this purpose to build basic infrastructure which would find many possible uses in the future.

The Committee would like to make the following recommendations with regard to connectivity:

- **Coordination amongst NKN and NMEICT:** There are two major national networking initiatives through NKN and NMEICT and there is a need for better synergy and coordination between them on connectivity issues in order to improve efficiency and to avoid duplication.

- **Limited connectivity usage:** Even though connectivity has been provided by the national networking initiatives, the Committee‘s feedback indicates that the use of this connectivity by students and faculty of institutions in general is limited. Therefore, the Committee recommends that wherever the limited usage can be traced to maintenance and running cost issues, adequate support be provided to such institutions.

- **Focus on bandwidth:** While 1Gbps and 10 Mbps bandwidth connectivity has been provided to the universities and colleges, respectively, in practice, the available bandwidth is much lower. Keeping in view the future requirement of educational institutions in the light of high bandwidth demands of various e-learning contents, the Committee recommends provisioning for need based augmentation of bandwidth.

- **Diversification of Connectivity Provisioning:** Committee recommends the contention of providing e-content access to all users through all possible connectivity mechanisms including EduSAT or narrowcasting TV signals or Direct to Home platforms in the all

regions of the country. Since TV and mobile phones have high penetration, cost of access through them should be weighed against accessibility through Internet.

- **Cloud based Computing and Connectivity Environment:** Considering the objective of the Mission, the bandwidth requirements, last mile connectivity solutions and BPO type of requirement for management of the e-content delivery, a Cloud based Computing Environment appears to be an appropriate type of platform.

  To implement cloud computing platform, the Committee suggests a following possible architecture (Figure 5.1) and a few details of the same.

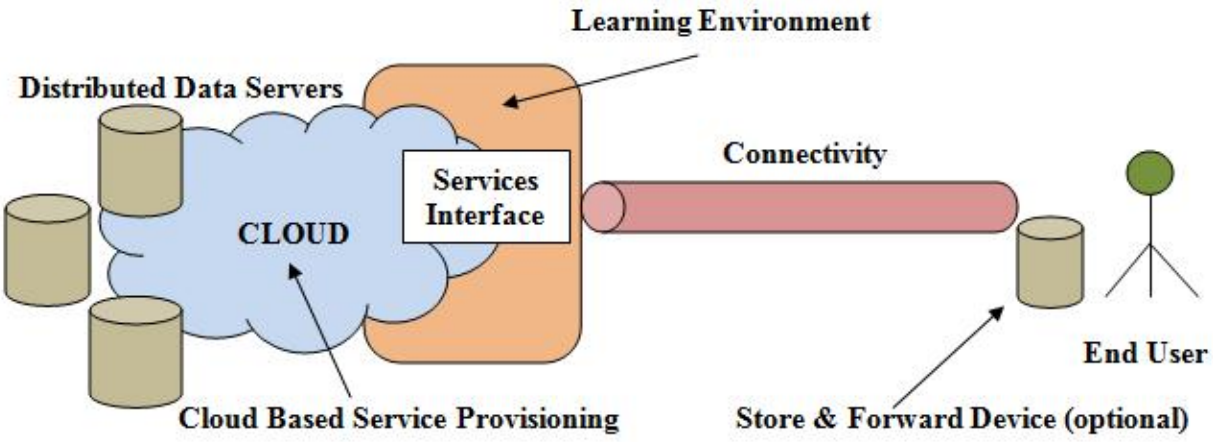

Figure 5.1: Cloud based Learning Architecture

  - A Cloud Services Based Architecture is proposed (Figure 5.1) for providing all the services required under NMEICT projects. The proposed architecture connects all the broad themes of NMEICT together. The generated content in active form (virtual labs) and passive form (videos) reside on distributed data servers spread across the cloud. SAKSHAT portal is to be upgraded to provide a *learning environment* that brings students and teachers together. Connectivity ensures that end users are always connected to the cloud services through various end devices. Optionally, to provide a seamless service, a store and forward device can be deployed at the end user premises which buffers information about the most recently used services from the cloud, so that in an event of connectivity failure, these services can be provided to the end user.

- Above architecture ensures that learning can happen in anytime – anywhere paradigm. It would also minimize the need for a technical expertise at the end user premise since all the infrastructure resides in cloud. Operation and maintenance of the above architecture can be either done by the NMEICT Mission itself or transferred to any other public/private organization. The above architecture only requires maintenance of the cloud. As end user premises require a store and forward device, a provision for minimal training can be provided by the Mission to the local administrators. Efforts can be undertaken at local and cloud level to prevent misuse of connectivity bandwidth for purposes other than learning.

- **Last Mile Connectivity Provisioning:** In regard to provisioning of connectivity to the end users, two main options are available namely DTH and Wireless/Wired based IP network. Although both types of connectivity have their pros and cons, the Committee recommends provisioning of both the options to address the diverse usage patterns of the end users in the country.

5.3 Access Device

The success of NMIECT Mission strongly hinges around a low cost device through which the content created can reach the learner. The concept of creating a $35.00 Low Cost Access Device (LCAD) is a game changer. The widespread talk of LCAD has actually generated a lot of interest and competition in the industry towards low cost solutions (in the form of low cost tablets) for addressing computing/accessing needs of a wide range of users.

- **Professional Approach:** The Committee recommends that a project of LCAD magnitude and importance should follow a professional approach in respect of design, components selection, layouts, prototyping, manufacturing and testing, etc. from the very inception. Appropriate documentation in this regard should be available at an appropriate repository or as an Intellectual Property portfolio.

- **Futuristic LCAD design:** It is recommended that LCAD be designed keeping in view the requirements and availability of bandwidth, quality of content to be displayed, availability of 24X7 connectivity and electrical power conditions. In addition, the design must be scalable and futuristic enough so that users can upgrade their requirements. The LCAD has to be

robust and of high quality to take care of heat, dust, moisture, rough handling, etc. LCAD has to be also designed progressively with increased indigenization of both hardware and software, with solar energy as a possible power source.

- **LCAD Availability in Multiple Models:** Keeping in view the increasing user requirements and buying capacities, the Committee feels that it would be a good option to bring out 2 or 3 models (good, better, best) of LCAD.

- **Provisioning of Back Office:** Along with the availability of LCAD, efficient after sales services both for hardware and software as well as contact facilities for helpline are essential components in the chain for utilization. Possibilities of creating Public-Private Partnership (PPP) based models could be considered for providing these services. A Back Office or Call Centre type structure could also be considered for providing support services to users of LCAD, connectivity and content.

5.4 General and Other Services

In regard to the General and Other Services, the Evaluation Committee makes following recommendations.

- **Massive Teacher Empowerment Programme:** Increasing penetration of ICT is changing the learning landscape rapidly. Conventional methods of teaching are giving way to newer avenues for dissemination of knowledge. In this changing paradigm, there is growing need to bridge the gap between the learners (students) who are always enthusiastic about ICT usage and the teachers who either lack familiarity or are less enthusiastic towards adopting ICT in teaching learning process. Hence, a massive programme ought to be initiated under the aegis of NMEICT for teacher's empowerment in order to fully benefit from the changing ICT based education scenario. Besides providing digital awareness and literacy, these programmes should also be structured to include training in ICT based pedagogy.

- **Breaking Language Barriers:** India being a country with a rich multi-lingual diversity, it is commonly observed that a large percentage of Indian population is more comfortable with

their regional language rather than English as far as learning processes are concerned. Therefore, it is important that the content in English language is also made available in regional languages through translation/transliteration so as to have wider impact of the content generated through the Mission. This would require a lot of imaginative effort to strengthen the existing mechanisms (automated or otherwise) and advances in natural language processing and machine translation tools. It is therefore suggested that research and development activity in this area be augmented.

- **Virtual University:** With the advent of ICT, a lot of non-conventional approaches to teaching and outreach have emerged like virtual classrooms, online exams, etc. One of the objectives of expanding higher education in India is to enhance access and improve quality. However, lack of availability of high quality faculty, supporting resources and infrastructure is a major impediment. One possible way to address this problem using ICT is to explore the possibility of establishing a full-fledged university in a virtual mode. Evaluation Committee recommends that the concept and feasibility of virtual universities needs experimentation through a prototype (pilot level) initiative.

- **Digitization of Books and Journals:** It has already become clear that LCAD (tablet) shall not only be used as an access device for content but also as an e-book/e-journal reader as it has the capability of storing hundreds of e-books/e-journals which the learner can read anytime, anywhere. Therefore, widespread penetration of LCAD should be synchronized with a massive digitization programme involving books, manuscripts, journals and archival materials available in various libraries and institutions across the country. Any copyright issues arising out of this initiative need to be addressed appropriately.

- **Outreach Programme:** Evaluation Committee observes that the National Mission has not attained a desirable level of visibility and has not penetrated throughout the country. It is therefore suggested that mechanisms must be devised to enhance outreach through publicity in all forms of media, develop presentation modules (DVD, ppt, posters, etc.) to be distributed to all educational institutions of higher learning. In addition, a group of experts should be commissioned to visit and conduct orientation programmes to inform learners and

teachers about the Mission and its activities. This activity should also be an enabler for drawing talented and interested teachers to participate in the Mission activities particularly in content development.

- **Facilitation of Entrepreneurship and Socio-Economic Development:** Although the key goal of the Mission is to create a knowledge enabled society in the country, Evaluation Committee recommends that the ambit of Mission be amplified to include socio-economic development related activities through content creation in areas like entrepreneurship (including social entrepreneurship), e-commerce, e-marketing, networking and mentoring, etc. This should be an enabler for self employment generation, new startups and women empowerment.

- **Private-Public Partnership:** In the present enrollment scenario in higher education, nearly 85% of students are in the private institutions which also command substantial faculty resources. In addition, there are many private players who are engaged in the field of e-learning. It is well known that many industries, in particular IT sector have developed learning resources (which are used for in-house training, as well as in 'finishing schools') which might be useful for more widespread use. It is imperative, therefore, that a way should be found to involve and engage them in the Mission's vision and activities. Avenues for engagement with leading industry bodies like CII, FICCI, ASSOCHAM, etc. in furthering the cause of the Mission also need to be explored.

- **Establishment of Certification Mechanisms:** With the increasing availability of content and corresponding enhancement of user profile, there will be aspirations on the part of the users to get a certification for the acquired knowledge. The Committee recommends that the Mission may examine the possibilities of creating a suitable mechanism (like an Academy) to facilitate such certifications.

5.4.1 Revamp of SAKSHAT Portal

The one stop portal named SAKSHAT is the face of the Mission to the outside world. Hence, it is imperative that state of the art technology and experts need to be employed to design, develop,

operate and maintain the portal, commensurate with its importance. In respect to the delivery of e-content throughout the country, a well defined protocol must be put in place so that all the e-content hosted in the portal is leveraged in the best possible way by the learners. In this regard, the Committee makes the following recommendations in addition to the content related recommendations indicated earlier in Section 5.1.

- **Distributed Services and Mirroring of Content:** Several regional mirror sites distributed across regions in India be created and be networked using the cloud based learning environment as given in Figure 5.1. Distributed storage and mirroring of e-content would reduce the load over the cloud.

- **Frequent Updates:** SAKSHAT portal shall have daily updates appropriately highlighting the new activities of NMEICT. Such updating will encourage more frequent views by visitors.

- **Online Management:** It will be helpful for overall management of the Mission as well as for those participating in its activities if a DASHBOARD based activity management services be installed on the SAKSHAT portal with appropriate access control for an online communications and for viewing the status of the project such as sanction, project reports, budgetary positions, etc.

- **Dedicated Qualified Staff:** SAKSHAT portal should have a dedicated Webmaster who will be responsible for the operation and maintenance of the portal. If required, services of a dedicated group of experts and professionals (private players may be involved) may also be utilized.

- **Navigation Facilities:** SAKSHAT portal is likely to be visited by learners with various degrees of proficiency for its optimal use. Hence, the navigation tools and the facilitation provided on the portal have to be user friendly and elegant and address the needs and requirements of users from different age groups, proficiency levels and motivation. Advanced search options based on keywords, authors, subject area, etc. should also be a part of the navigation facilities on the portal.

- **Detailed Analytics and Monitoring:** SAKSHAT portal must display a detailed account of usage statistics in terms of number of page hits, number of download, user browsing patterns, etc. SAKSHAT portal needs to provide a tool to facilitate regular monitoring and peer surveillance (vigilance) of the portal so that it gets improved and upgraded from time to time.

- **Feedback and Engagement Forum:** SAKSHAT portal should provide windows for feedback, discussion forums, chat boxes, etc. so that it remains a vibrant and networked forum for users and peers. The portal should also provide a window for eliciting "Expression of Interest" from prospective experts who are willing to be engaged to contribute to the Mission.

- **SAKSHAT – A National Repository:** In the long run, SAKSHAT portal should be positioned as a National Repository for all scholarly and creative output from the country, thereby considerably amplifying its scope, utility and visibility.

5.4.2 A New Structure for the NMEICT Mission Management

The Evaluation Committee deliberated at length on the present structure of the NMEICT Mission and has come to a firm conclusion that a new structure (Figure 5.2) for its management and operations is necessary in order to fully deliver on its objectives and ambitions.

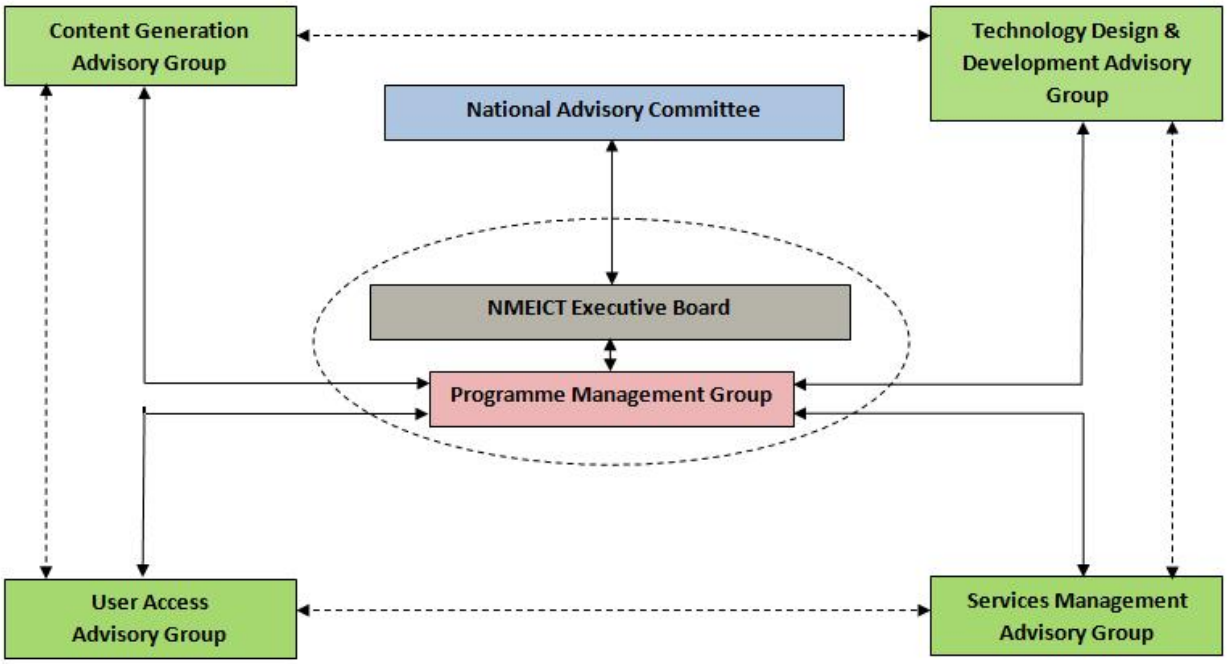

Figure 5.2: A New Structure for NMEICT Mission Operation

Salient features of the new structure for NMEICT Mission operation are:

- Appropriate connect between Expert Groups, Management of the Mission and the Government is the cornerstone of the proposed structure.

- While the new structure envisages an independent Mission Directorate outside the Ministry, it also provides for a robust linkage with the Government at the Apex Level.

- The new three tier structure attempts to blend the weightage given to independent peer opinion with accountability and renders the overall process more participative and transparent.

Given below are the composition and functions for each of the three tiers of the new structure for NMEICT Mission management and operation.

Composition:

National Advisory Committee (NAC)	
Chair	
	Minister, MHRD
Members	
	All Members of NMEICT Executive Board Chairman
	Additional Secretary (TEL)
	IFD Additional Secretary, MHRD
	Secretaries of DOT, IT, DST, Health, Agriculture and Law
	Chairman AICTE
	Chairman UGC
	Two leading industrialists
	Four members from amongst the Directors of IITs, NITs, IIITs and VCs of Central Universities
	Four VCs from Universities
	VC IGNOU
Member Secretary	
	Secretary, Higher Education, MHRD

Figure 5.3: Constitution of National Advisory Committee (NAC)

NMEICT Executive Board (EB)	
Co-Chairs	
	A Distinguished Academician
	Secretary, Higher Education, MHRD
Members	
	Three ex-Officio members (one each from Planning Commission, Finance Dept. of MHRD and MCIT, not below the rank of Joint Secretary)
	Five independent domain experts to be nominated by NAC.
Member Secretary	
	Executive Director (full time)

Figure 5.4: Constitution of NMEICT Executive Board (EB)

Programme Management Group (PMG)	
Chair	
	One out of the five independent domain experts
Members	
	Chairs of all four Advisory Groups (*ex-Officio*)
	Four independent domain experts to be nominated by the Executive Board (EB) from the areas of engineering, science, technology, management, law, medicine, agriculture, vocational training, etc.,
Invitees	
	Director MHRD
	Director Higher Education (NMEICT)
	Director IFD
Member Secretary	
	Executive Director, EB (*ex-Officio*)

Figure 5.5: Constitution of Programme Management Group (PMG)

Functions:

1. National Advisory Committee (NAC)

National Advisory Committee (NAC) will be chaired by Minister, HRD and its membership is indicated in Figure 5.3.

i) Broad policy framework of NMEICT.

ii) Ratifying proposals that are screened and approved by the Executive Board (EB). However, project proposals beyond a budget of Rs. 10 Crores will be sanctioned by the National Advisory Committee (NAC) on the recommendation of EB.

iii) Monitoring of activities and progress of the Mission.

iv) Budget approval and allocations as recommended by EB.

The NAC will meet at least two times in a year.

2. Executive Board (EB)

The Executive Board (EB) will be co-chaired by a Distinguished Academician (nominated by the Minister, MHRD) and Secretary, Higher Education from MHRD. The membership of EB is indicated in Figure 5.4.

There shall be a full time Executive Director (ED) who shall be the Member Secretary and will not be below the rank of Additional Secretary in the Government. The ED, having professional and administrative experience, shall be appointed through an open advertisement process and Search-cum-Selection Committee constituted by Minister, MHRD.

Executive Board shall have a dedicated office hosted in one of the centrally funded Government Institution. A suitable Memorandum of Agreement (MoA) shall be signed between the Institution and MHRD.

i) The EB will be responsible for all the activities under the NMEICT Mission.

ii) The EB is empowered to create suitable governance and operational mechanisms in all activities of the Mission for efficient and smooth functioning.

iii) The EB will prepare a blueprint for invitation, processing and reviewing of project proposals by Programme Management Group (PMG).

iv) The EB will have financial powers to approve all projects and expenditure up to Rs. 10 Crores. However, all approved projects and activities will have to be reported to the NAC for ratification. In case of projects and activities exceeding Rs. 10 Crores, its recommendations will be placed before NAC for approval.

v) The EB will prepare the annual budget of the Mission to be placed for approval before the NAC.

vi) The EB will be responsible for all matters related to SAKSHAT portal.

The EB will meet at least four times a year.

3. Programme Management Group (PMG)

The Programme Management Group (PMG) will be chaired by one of the five independent domain experts of EB and its membership is indicated in Figure 5.5.

i) PMG shall formulate guidelines for inviting proposals and scrutinizing them through a robust peer review system. To facilitate this process, PMG shall take advice from various advisory groups (in areas like content, technology design and development, user access, services management etc.) which may be constituted with the approval of EB.

ii) All recommendations of PMG should be submitted to EB for approval.

iii) PMG shall be responsible for monitoring and review including on-site assessment, etc. as per the directions set by the EB.

The PMG will meet at least four times in a year.

5.4.3 Financial requirements projection

Looking at the financial allocations and expenses incurred during the 11th Five Year Plan and assessing the future activities and requirements, the Evaluation Committee suggests the following budget estimates.

Category	Estimated Budget Amount Required (in Crores)
Content generation, Virtual labs	1500
Pedagogy, content related R&D and operations & maintenance of SAKSHAT portal	1000
All types of Connectivity including DTH.	3000
Low cost access device	5000
Other Services including administrative expenditures and Host Institution expenditure	1500
Total	12,000

Table 5.2: Financial Estimates for NMEICT in future

5.5 Road Ahead

NMEICT Mission has been an ambitious enterprise with the potential of a game changer in the higher education arena. It has met with modest success and has some achievements to its credit particularly in establishing widespread connectivity and supporting availability of e-resources. It has also been able to inculcate the culture of ICT in education and create a network of experts in a limited way.

In order to ensure that optimal value and outcomes are derived from the investments already made, it is important to undertake an in-depth and rigorous independent peer review of top few high-investment projects and decide if incremental funds can result in completion (within a clearly define time frame), full documentation and appropriate distribution/dissemination of these projects. All large projects will need to be monitored closely till completion. Without this, the large amount of intellectual and financial investment made in these projects will go waste, without any major benefit to the education system in the country.

(Note: A total approved funding of 442 Cr (90% of total approved funding of 488 Cr) has gone into 11 projects (13% of total of 86 projects). Yet only 4 of these projects indicate "Completed" status.)"

However, the future agenda should be to provide a completely seamless ICT infrastructure for anytime-anywhere-anything educational resource in an equitable fashion across the vast geographical areas and the enormous learners spread over it. This ICT based knowledge revolution would reflect in terms of socio-economic dividends and enable India to emerge as a super power. The Committee has endeavored to provide a slew of recommendations which will provide a roadmap for re-engineering the NMEICT Mission and fulfillment of a great national ambition. In addition, integration of efforts of different Ministries such as MHRD, MCIT, DOS, etc. related to ICT in education leading to greater convergence is essential.

Concluding Remarks

- NMEICT Mission has in a limited way addressed the issues related to access, equity and quality which are at the vanguard during the current expansion phase of higher education. However, the full potential of ICT as a powerful tool to effectively address the key

challenges involving access, equity and quality in Indian higher education remains to be fully harnessed. Availability of LCAD, amplification and diversity of offerings and ease of navigation on SAKSHAT portal, availability of content in multiple languages, increasing Internet penetration in educational institutions and access to digital resources, etc. offer great hope and opportunity for making a digital transition to a seamless world of knowledge in an inclusive manner. A reinvented NMEICT Mission can play a pivotal role in this endeavor.

- The increasing high demand for higher education has stimulated significant growth in both private and public provision. Open universities which depend on technology integrated learning are also expanding and multiplying. Many conventional higher educational institutions are adopting dual mode or blended programme delivery systems, thereby creating a new dynamic, flexible lifelong learning environment. In this context, the experimentation in the form of establishment of Virtual Universities has not yet proved its viability. Therefore, introduction of ICT in a systematic manner with a clearly defined outreach strategy in both public and private higher educational institutions in our country is an important objective. It is suggested that NMEICT Mission should contemplate generating new idea based models and initiatives for ICT enabled learning on a sustainable basis.

- It is important to devise strategies that will strongly relate digital learning processes to socio-economic development issues. In particular, digital outreach should be an enabler for self employment, skill development, women empowerment, etc. A roadmap specifically targeted to this objective needs to be crafted.

- Avenues of partnership with private and foreign entities involved in digital learning space needs to be explored.

- NMEICT Mission needs to factor-in the emerging international challenges and competitions from other similar initiatives elsewhere such as MIT's Open Courseware.

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Appendix 1: NMEICT Mission Document

NMEICT Mission Document is a single most important official document in public domain which explains the Mission in detail. It outlines the background highlighting the need for the Mission, its objectives, scope and components. Furthermore, it also mentions its projected outcomes, implementation strategies and organizational structure.

The complete Mission Document is available at the SAKSHAT portal and can be downloaded from the link below.

http://www.sakshat.ac.in/pdf/missiondocument.pdf

Appendix 2: Dates and Synoptic view of proceedings

Evaluation Committee has held 14 meetings to deliberate upon the NMEICT Mission and work out its recommendations in accordance to the wide ranging Terms of References (ToRs). Given below in this appendix are the dates and synoptic view capturing the proceedings of meetings of Evaluation Committee:-

13.7.2011: Evaluation Committee Meeting (Venue: Shastri Bhavan, MHRD)

* Broad framework for evaluation was agreed upon.

* Feedback to be solicited from PIs and co-PIs of various projects sanctioned under the Mission.

* Questionnaire in this regard was to be prepared and circulated among PIs.

3.9.2011 – 4.9.2011: Two day Meeting cum Presentation from PIs of major NMEICT projects (Venue: IIT, Delhi)

* It was decided that the Evaluation Committee was not reviewing the projects *per se* but was looking at evaluating the functioning of NMEICT Mission.

* Need was felt for standardization of a technological framework, quality assurance of the content, user friendliness, etc.

* Inadequate preparedness of institutions for technical networking and there was cases wherein administrative expedience was highly desired.

17.10.2011: Evaluation Committee Meeting (Venue: GGSIPU Campus)

* Need felt to put in place an effective structure run such an important and large magnitude project.

* Questionnaire addressing the four-quadrant approach to be designed for circulation among faculty members from various parts of India.

* Decided to have consultative meetings with stakeholders to deliberate the future course of action for the Mission.

28.3.2012: Evaluation Committee Meeting (Venue: MHRD)

* Overall assessment of the project and to discuss with the Mission Directorate for the continuance of the project.

15.4.2012 – 16.4.2012: Evaluation Committee Meeting (Venue: GGSIPU Campus, Dwarka)

* Drafting of the report and its format was deliberated.

* Contents of the initial chapters were drafted.

27.4.2012: Evaluation Committee Meeting (Venue: IIT Madras)

* Online feedback on NPTEL project was discussed.

* The type of analysis of the data required was finalized.

4.5.2012: Evaluation Committee Meeting (Venue: GGSIPU Campus, Dwarka)

* The first version of the report was finalized.

* Gaps were identified for further improvement.

11.5.2012: Evaluation Committee Meeting (Venue: GGSIPU Campus, Dwarka)

* Modification of the report on the basis of new inputs, especially from NPTEL feedback data.

* Modification was further carried out on the basis of the collected feedback from developers, collaborators and learners.

6.6.2012: Evaluation Committee meeting (Venue: GGSIPU Campus, Dwarka)

* Review of third draft version of the Report.

* New organizational structure of NMEICT based on the feedback.

* Decided to incorporate suggestions from experts on the Mission.

14.6.2012: NMEICT Expert meeting (Venue: GGSIPU Campus, Dwarka)

* For connectivity issues, four experts were invited for consultation out of which two members attended the meeting to discuss the needed networking structure for implementation of the Mission's objectives.

* Mr. Vaidyanathan, CEO, Classle suggested a cloud based learning environment

* Dr. Ramani's views on the Mission and its plan of actions were discussed

8.8.2012: NMEICT Review Committee meeting (Venue: Habitat World)

* Decided to incorporate the methodology adopted into the report as well

* Held a meeting with NMEICT Mission Secretariat later in the evening

3.9.2012: Consultative meeting with Experts from Academia / Industry (Venue: Habitat World)

* General perception about the NMEICT Mission and its importance in today's context was discussed.

* Discussed on low cost access device and connectivity aspects of the Mission.

* Also discussed the proposed organizational structure for the effective functioning of the NMEICT.

13.9.2012 - 14.9.2012: Meeting for report finalization (Venue: Habitat World)

* Two day's meeting where all the feedbacks obtained were deliberated and version 7.0 of the Report was further fine tuned.

* Chapter by chapter write-ups were taken for discussions and further modifications were incorporated.

1.10.2012: To finalize the report.

Appendix 3: Details of approved NMEICT Projects

In order to realize NMEICT Mission's objectives, a number of projects have been approved by the Mission Directorate working under MHRD encompassing diverse partner institutions in different parts of the country. The approved projects were classified into two categories by the Mission Directorate based on the budget and approval processes, namely, major/large projects and minor/small projects. Projects with funding of more than 20 Lakhs were considered as major projects while those with 20 Lakhs or less were considered as minor projects.

Given below is a reproduction of the list of approved projects as on 31st December, 2011 (as received from the Mission Directorate in the form of Executive Summary). For every project, information related to the following key parameters has been extracted and detailed in a tabular format:-

- Project Title
- Name of Partner Institute (s)
- Principal Investigator (PI) / Co-Principal Investigators (Co-PIs)
- Deliverables (as per project Report)
- Main Project Cost
- Funds Released So Far
- Progress as on Date

A total of 49 major projects (more than 20 Lakhs) and 37 minor projects (20 Lakhs and less) have been funded under the NMEICT Mission.

A3.1 Content

A3.1.1 Major or Large Projects

1. Production of course ware for PG Subjects

Project Title	Production of courseware for PG Subjects.
Name of Partner Institute (s)	UGC
P.I & Co- P.I Name	Chairman, UGC and Secretary, UGC.
Deliverables (as per project Report)	e-Content development in 77 to 82 PG Subjects as offered in NET examination in Humanities, Social Sciences, Languages (Indian & foreign), cultural studies. Also Computer science, electronic science & environmental science etc. Subjects: Economics, Pol. Science, Philosophy, Psychology, Sociology, History, Anthropology, commerce, Education, Social Work, Defence and Strategic Studies, Home Science, Public Admn., Population Studies, Music, Management, Maithili, Bengali, Hindi, Kannada, Malayalam, Oriya, Punjabi, Sanskrit, Tamil, Telugu, Urdu, Arabic, English, Linguistics, Chinese, Dogri, Nepali, Manipuri, Assamese, Gujarati, Marathi, French, Spanish, Russian, Persian, Rajasthani, German, Japanese, Adult Educn./ Continuing /Andragogy/Non Formal Edun., Physical Eudn. Arab culture and Islamic Studies, Indian Culture, Labour Welfare/Personnel Management/Industrial Relations/ Labour and Social Welfare/Human Resource Managemen, Law, Library and Information Science, Buddhist, Kaina, Gandhian and Peace Studies, Comparative Study of Religions, Mass Communication and Journalism, Performing Arts – Dance/Drama/Theatre, Museology & Conservation, Archaeology, Criminology, Tribal and Regional Language /Literature etc.
Main Project Cost	Rs.84.00 Crores
Project Sanction no & Date	Proposal submitted by the UGC has been approved by the PAB in its 21st meeting held on 11.8.2011

Funds released so far	Rs.84.00 Crores released in Oct. 2011
Progress as on date	A Standing Committee constituted under the Chairmanship of Prof. M. Ananda Krishnan. No other data provided by UGC.

2. Virtual Lab under centrally Sponsored Scheme

Project Title	Virtual lab under the centrally sponsored Scheme	
Name of Partner Institute (s)	Indian Institute of Technology , Delhi IIT Kanpur, IIT Bombay, IIT Madras, IIT Kharagpur IIT Guwahati, IIIT Hyderabad, IIT Roorkee, Amrita university Dayalbagh Educational Institute, NIT Surathkal, COE Pune	
P.I & Co- P.I Name	IIT New Delhi	Prof R.K. Shevgaonkar, Director IIT Delhi & Prof Ranjan Bose, IIT Delhi
	IIT Kanpur	Prof. Joseph John, Prof. Sameer Khandekar
	IIT Mumbai	Prof. Santosh Narohna Prof. Anil Kulkarni
	IIT Madras	Prof. P. Sriram
	IIT Kharagpur	Prof. C. S. Kumar
	IIT Guwahati	Prof. Ratnajit Bhattacharya
	IIIT Hyderabad	Prof. Jayanti Sivaswamy
	Amrita University	Prof. Krishnashree Achuthan
	Dayalbagh Educational	Prof. Soami Satsangi

	Institute IIT Roorkee Prof. Vinod Kumar NIT Surathkal Prof. K. V. Gangadharan COE, Pune Prof. Sudhir Agashe
Deliverables (as per project Report)	Development of Virtual Labs & its productization Total of 80 Labs in 9 disciplines
Main Project Cost	80 Crores + 22 Crores (Pilot Project)
Funds released so far	78 Crores
Progress as on date	Virtual Lab inaugurated by Hon'ble HRM.130 labs developed.

3. National Programme on Technology Enhanced Learning

(NPTEL Phases II & III)

Project Title	National Programme on Technology Enhanced Learning (NPTEL Phases II and III)
Name of Partner Institute (s)	IIT Madras, IISc Bangalore, IIT Bombay, IIT Delhi, IIT Guwahati, IIT Kanpur , IIT Kharagpur, IIT Roorkee .
P.I & Co- P.I Name	Prof Bhaskar Ramamurthy & Prof. Mangala Sunder.
Deliverables (as per project Report)	1. Conversion of NPTEL phase I video courses in streaming video lecture format and setting up eight distributed national video servers for delivering lectures on demand in each of the eight partner institutions (PI). 2. Creation of additional 600 web and video courses in all major branches of engineering, physical sciences at the undergraduate and postgraduate levels and management courses at the postgraduate level. 3. Integration of college curricula in engineering education with NPTEL contents through a large number of course specific workshops and interaction with colleges in India for improving TEL infrastructure. 4. Creation of discussion forum for each course created under the NPTEL using a grid of computer servers and

	setting up FAQ's for each course. 5. Indexing of all video and web courses and setting up powerful search engines to enable content and keyword search on all topics in science and engineering developed under NPTEL. 6. Setting up internal infrastructure in each IIT for implementing virtual online certification programmes in science and engineering.
Main Project Cost	96 Crores.
Funds released so far	2008-09 Rs.10.0 Crores. 2009-10 Rs.40.35 Crores. 2010-11 Rs.6.0 Crores. 2011-12 Rs.20.0 Crores. Total: Rs.76.35 Crores.
Progress as on date	Creation of 990+ web and video courses in all major branches of engineering, physical sciences, at the undergraduate and postgraduate levels and management in progress. Expected Date of completion of the project: 30 June 2012. 1. Conversion of NPTEL phase I video courses in streaming video lecture format – completed. 2. Setting up eight distributed national video servers for delivering lectures on demand in each of the eight partner institutions (PI). – On going 3. Creation of 600 web and video courses in all major branches of engineering, physical sciences at the undergraduate and postgraduate levels to be completed by June-July 2012 and management courses at the postgraduate level – 360 courses in Engineering, Sciences, Technology, Humanities and Management are ongoing and expected to be completed by March 31, 2013. 4. Integration of college curricula in engineering education with NPTEL contents through a large number of course specific workshops and interaction with colleges in India for improving TEL infrastructure. – Ongoing 5. Creation of discussion forum for each course created under the NPTEL using a grid of computer servers and setting up FAQ's for each course. – Ongoing

	6. Indexing of all video and web courses and setting up powerful search engines to enable content and keyword search on all topics in science and engineering developed under NPTEL. – Ongoing 7. Setting up internal infrastructure in each IIT for implementing virtual online certification programme in science and engineering. – Ongoing

4. INFLIBNET

Project Title	INFLIBNET
Name of Partner Institute (s)	INFLIBNET, Ahmedabad (IIT, Delhi)
P.I & Co- P.I Name	Director, IIT Delhi and Dr. Jagdish Arora, INFLIBNET, Ahmedabad
Deliverables (as per project Report)	Access to Annual Reviews, Nature and Project Muse to 34 Technical Institutions/Universities. Access to 3700+ e-journals and 74000+ e-books to 1482 colleges. 4000 colleges will be given access to e-resources with ~2,75,000 users. Access to IEL Online, ASME and ASCE to 100 Engineering Colleges
Main Project Cost	Rs.55.115 Crore*
Funds released so far	Rs.55.115 Crore
Progress as on date	For College students 74,000 e-books from 297 publishers, 3700 e-Journals are available to 1,08,729 students associated to 1,512 Institutions. Similarly for University

	students more than 7,500 e-Journals to students associated to 297 Institutions are available from INFLIBNET & IIT Delhi. Full text e-Thesis numbering 2224 is also available on INFLIBNET network. The Project is an ongoing activity.

**: Assumed Main Project Cost (equal to Funds released so far), no data obtained from MHRD*

5. Production of courseware for UG Subjects – CEC, UGC

Project Title	Production of courseware for UG Subjects.
Name of Partner Institute (s)	CEC, UGC
P.I & Co- P.I Name	Dr. Tilak R Kem, Dr. Sunil Mehru (Co-PI)
Deliverables (as per project Report)	Phase-1: Physics, Communication & Journalism, Environmental Science, Hindi Language & Literature, Botany, Economics, Business Management, Zoology, History, English Language & Literature (H), Mathematics, Sociology, Anthropology (G+H), Computer Science, Geography, Performing arts, Chemistry, Geology Projects= 5700 e-content modules & Training & Workshop Phase 2: 68 subjects x 355 modules = 24,140 One Hour Programmes, Training & Workshop. Partnership with the Educational Multimedia Resource Centers throughout the country. Subject covered:- Psychology, Social Welfare Administration, Human Rights, Business Economics, Hindi Journalism Music (Ravindra Sangeet), Music (Karnataki Sangeet), Music (Hindustani Classical), Philosophy, Political Science, Sanskrit, Social Work, Urdu, B.A. Human Resource Management,

	Management & Marketing of Insurance, Marketing Management & Retail Business, Office Administration & Secretarial Practice, French & Spanish, Special Education for Visually Impaired, Mathematical Science, Bio-Chemistry, Biomedical Science, Electronics, Food Technology, Home Science Microbiology, Polymer Science, Statistics, Agro-Chemical and Pest Control, B.Sc. Analytical Methods in Chem & Bio-Chem, Applied Life Science (Sericulture,. Applied Physical Sciences (Computer Science), Applied Physical Sciences (Electronics), Applied Physical Sciences (Environmental Science), Applied Physical Sciences (Industrial Chemistry), Life Sciences , Agriculture, Physical Sciences, Bachelor of Applied Sciences Instrumentation, Bachelor of Fine Arts, Painting Applied Art Sculpture, Population Studies (E.M. & T.M.), Public Administration, Multimedia, Text Editing & Manu Scriptology, Criminology & Forensic Science , Yogic Science , Film Studies, Vocational Studies (Accounts), Vocational Studies (Advertisement), Vocational Studies (Computer), Vocational Studies (Office Audit), Vocational Studies (Photography), Vocational Studies (Book Publishing), Vocational Studies (Videography), Vocational Studies in 22 Courses, Theatre Arts, Bio-Informatics
Main Project Cost	54,36,87,500. Phase-I & Phase-II + 50,00,000 Pilot Project
Funds released so far	8.9 Crores PAB of NMEICT has approved Rs.1 Crores in its 3rd meeting on 25.03.2009 1st installment: 50 Lakhs as on 01-07-2009 PAB has approved Rs. 5.40 crore(30% of Rs. 12 crore & 30 % of Rs. 6.50 crores) for the main project held on 24.01.2011 1st installment : 5.40 crores(as on 28.02.2011 Installment:3.00 Crores. Total 11.9 Crores

Progress as on date	2043 e-content modules, 35.84%, Phase I expected date of completion March 31, 2013. Production of e-content for Phase II has already begun.

6. National programme on technology enhanced learning for social sciences and humanities – IGNOU, New Delhi

Project Title	National programme on technology enhanced learning for social sciences and humanities(17 Courses)
Name of Partner Institute (s)	IGNOU, New Delhi
P.I & Co- P.I Name	Mr. Raj Sekharan Pillai
Deliverables (as per project Report)	10 Courses (Pilot Phase)
Main Project Cost	75 Crores + 95 Lakhs (Pilot Project)
Funds released so far	1st Installment: 1.44 Crore on 12.02. 2010
Progress as on date	No response from PI or New PI. No details on coursework assignment submitted.

7. Development of Computerized Vocational Educational Modules and Use of Hepatic devices for Training

Project Title	Development of Computerized Vocational Educational Modules and Use of Haptic devices for Training
Name of Partner Institute (s)	Amrita Vishwa Vidyapeetham , Coimbatore
P.I & Co- P.I Name	Dr. Bhavani B, Dr. Then Kuussi Keswadas, Dr. Venkat Ragan, Dr. Kamal Bijlani, Dr. Kumar rajamani, Rajesh Sharma
Deliverables (as per project Report)	Development of vocational educational modules and the use of haptic devices for education & training

	Mass production of haptic devices for 10,000 centers Workshop/orientation Installation of haptic devices, orientation programmes / module / computerized vocational programs at 10,000 centre Support & maintenance Create the course content, video tutorials , interactive 2D & 3D virtual labs and work books. Quizzes and deployment Development of 3 low cost devices
Main Project Cost	159.23 Lakhs 2.87 Crores + 1.25 Crore (Pilot Project)
Funds released so far	Pilot project : 1.25 crore 1st installment: 62.50 lacs decided by PAB on 25.03.09 2nd installment: 62.50 lacs approved by PAB on 15.12.09 Extended Pilot: 1.62 crore 1st Installment: 90 lacs through IIT Delhi Amrita University has received only 63 Lakhs from the 90 Lakhs released to IIT Delhi Main Project cost: 159.23 lakhs 1st installment: 90 lakhs through IIT Delhi
Progress as on date	As per PI 78% work under Pilot Project has been accomplished.

8. Vocational Courses e–enabled with delivery through ICT and conversion to Regional Languages

Project Title	Vocational Courses e–enabled with delivery through ICT and conversion to Regional Languages
Name of Partner	DEI University, Agra

Institute (s)	
P.I & Co- P.I Name	Dr. M. Radha Krishna
Deliverables (as per project Report)	Pilot: Textile Designing & Printing (5 courses) & Translation in to regional languages. Motor Vehicle Mechanic: 4-Wheeler Modern Office Management & Sec. Practice, Dress Des. & Tailoring, Wireman, Electrician Generation of high quality video content Supporting website Course wiki and discussion forum Messaging service online or offline.
Main Project Cost	Rs. 15.10 Crores + Rs. 1 Crore (Pilot Project)
Funds released so far	PAB of NMEICT has approved Rs. 1 Crore in its 3rd meeting on 25.3.2009 1st Installment: 50 Lakhs (as on 31.3.09) 2nd Installment: 50 Lakhs (as on 09.3.2010)
Progress as on date	Project halted due to want of funds

9. E-Content creation in economics, mathematics, commerce, history, zoology and botany – Delhi University

Project Title	E- content creation in the area of economics, mathematics, commerce , history , zoology & botany
Name of Partner Institute (s)	Delhi University, New Delhi
P.I & Co- P.I Name	Prof A K Bakshi
Deliverables (as per project Report)	E content development for 40 subjects for UG & PG course

Main Project Cost	1 Crore*
Funds released so far	1 Crore
Progress as on date	PI changed, Very little progress or no progress, no response from PI or new PI.

**: Assumed Main Project Cost (equal to Funds released so far), no data obtained from MHRD*

10. Development of vocational educational module and use of haptic devices: virtual laboratories for VLSI and embedded system

Project Title	Development of vocational educational module and use of haptic devices: virtual laboratories for VLSI and embedded system
Name of Partner Institute (s)	Mizoram university, Mizoram VJTI
P.I & Co- P.I Name	Mizoram University Virtual laboratories for VLSI and embedded system Prof. NP Maity VJTI Vocational educational module Dr. Nisha Sarwade
Deliverables (as per project Report)	✓ Basic infrastructure called " IMAGE VLSI & EMBEDDED LAB 05" to be established ✓ Content delivery for teaching training ✓ Content delivery for students ✓ Suggested course for teacher training
Main Project Cost	Rs. 395 Lakhs + Rs. 1 Crore (Pilot Project)
Funds released so far	PAB of NMEICT has approved Rs. 1 crore to IIT Delhi as a coordinator for both the projects in its 9th meeting held on 3rd & 11th Sept 2009. IFD has approved this amount and released to IIT Delhi

	Rs 1 Crore on 22.02.10 Till now Mizoram University has not received any funds for the Project.
Progress as on date	Project not yet started due to funds not yet received by the University / PI of the project

11. OSCAR++

Project Title	OSCAR++
Name of Partner Institute (s)	IIT Bombay
P.I & Co- P.I Name	Prof. Sridhar Iyar
Deliverables (as per project Report)	1. 300 Instructional design documents to be created 2. 300 learning objects(such as animation and simulation) to be developed, integrated with audio video, assessment interactivity 3. 12 workshops to be conducted- 4 Instructional design and 8 Blender Workshops 4. 600 people to be trained
Main Project Cost	3.74 Crore
Funds released so far	PAB of NMEICT has approved Rs 90 Lakhs(30% of project cost) 1st installment: Rs. 90 Lakhs on 24.01.2011
Progress as on date	As on 3rd September, 2011:- 150 Instructional Design Documents (IDD) developed 66 Learning Objects developed and uploaded (to date), 68 under development (will be completed by Dec. 2011) 7 workshops conducted - 3 instructional design workshops and 4 Blender training-cum-awareness workshops 86 trained in Instructional Design Workshops 30 trained in creation of 3D Blender animation 670 participated in Blender awareness workshops

	Blender Spoken-Tutorials based: 15 Spoken-Tutorials completed (script-writing, video capture, audio dub). 22 scripts ready. As on 2nd December, 2011:- 209 Instructional Design Document developed, 91 under development 131 Learning Objects developed and uploaded (to date), 52 under development 8 Workshops conducted – 3 Instructional design workshops and 5 Blender training-cum-awareness workshops 97 trained in Instructional design workshops 30 trained in creation of 3D Blender animation 700 participated in Blender awareness workshops 2 research papers in international and national conferences 1 stall at FOSSEE (Sept 2011)

12. UG Course content in cultural education – DEI University, Agra

Project Title	UG course content in cultural education, rural development, proficiency in Indian music, drawing & painting , journalism and mass communication
Name of Partner Institute (s)	DEI University, Agra
P.I & Co- P.I Name	Dr. K. Santi Swraup, Dr. Nandita Satsangee
Deliverables (as per project Report)	Core course: cultural education, rural development, proficiency in Indian music BA Course: 1 Year course in drawing & painting

	BA course: 1 Year course in journalism & mass communication
Main Project Cost	Rs. 6.3 Crores
Funds released so far	PAB of NMEICT has approved 50% of total project cost in 25.3.2009 1st Installation: 37,50,000=00 on 31.03.2009 2nd Installation: 37,50,000=00 on 15.12.2009
Progress as on date	Videos recorded for the major project.

13. E content generation for post graduate program in environment science

Project Title	E content generation for post graduate program in environment science
Name of Partner Institute (s)	Teri University
P.I & Co- P.I Name	Dr. Suresh Jain Dr. Prateek Sharma
Deliverables (as per project Report)	E-contents for 20 different course under environmental science program at PG Level
Main Project Cost	3.55 Crores
Funds released so far	75 Lakhs as on 31.03.2009
Progress as on date	Funds spent as on March 31, 2012 is Rs.10,807,403/- & production of 11 Courses out of 20 Courses which would be uploaded on website by 30th April 2012. It may be noted that 25% of the work of the 3 courses (Environmental Modelling, Integrated Impact Assessment and Integrated Watershed Management) from the remaining 9 courses. Approximately, fifty percent of the work of three courses in addition are also been completed.

14. Expansion of Technology Enabled Learning Initiatives

Project Title	Expansion of Technology Enabled Learning Initiatives
Name of Partner Institute (s)	Visvesvaraya Technical University
P.I & Co- P.I Name	Prof. Ramesh, Head E-Learning Centre, VTU, Mysore
Deliverables (as per project Report)	e- Content of 10 selected course from Phase I of NPTEL video based lectures. Addition of quadrants of learning.
Main Project Cost	Rs. 70 Lakhs
Funds released so far	PAB of NMEICT has approved Rs.70 Lakhs in its 10th meeting on 29.10.2009 IFD has approved release Rs 70 Lakhs 1st Installment: 70 Lakhs as on 9.12.2010 but funds not yet released.
Progress as on date	1. List of subject and SME's are identified and communicated vide Ref:VTU/ELC/2011-12/1335 dated: 20th September, 2011 2. Presented a PPT presentation comprising VTU e-Learning initiatives at NITK Suratkal 3. Requisition letter to release funds vide Ref. No.:VTU/PS/2011-12/1018 dated 13.05.2011

15. E content generation and e skill test in specialized areas of information technology – CDAC, Noida

Project Title	E content generation and E skill test in specialized areas of information technology
P.I & Co- P.I Name	Dr. V. K. Sharma
Name of Partner Institute (s)	CDAC, Noida
Deliverables (as per	Courses in the area of IT

project Report)ta	✓ 6 Courses in the PG diploma program in GIS& RS ✓ 7 Courses in the PG diploma program in ASDD ✓ 6 courses in the PG diploma program in SDA ✓ 7 courses in PG diploma program in ISAD
Main Project Cost	Rs.182 Lakhs
Funds released so far	PAB of NMEICT has approved Rs 7*26 =182 Lakhs in its 2nd and 16th meeting held on 1.09.10 Amount proposed to be released = Rs 54 Lakhs(30% of total project course) IFD has approved release of Rs 54 Lakhs 1st installment: Rs. 54 Lakhs on 20.12.2010
Progress as on date	Project completion date as December 2012. Development of FQM based e-contents in specilaized areas of I.T. Contents are being created in specialized I.T areas like Information security, Advanced Software design & development, Systems & database Administration, Geographical information systems & remote sensing

16. Introduction to Programming & its mathematical foundation – KMIT, Hyderabad

Project Title	Introduction to programming and its mathematical foundation(for UG & PG Courses)
Name of Partner Institute (s)	Keshav Memorial Institute of Technology, Hyderabad
P.I & Co- P.I Name	Dr. Jayant Kirtane Dr. Ambuja Salgankar
Deliverables (as per project Report)	80 Lessons in 12 months
Main Project Cost	Rs 54 Lakhs* + Rs. 7 Lakhs (Pilot Project Cost)
Funds released so far	1st installment: Rs. 54 lakhs on 06.01.2011
Progress as on date	Funds remitted by MHRD to Mumbai University on 4-4-2011 Added: Funds remitted to KMIT on 15-11-2011. Next, slot for recordings: Summer of 2012 Lab manual for hands-on self study: As of 31 March,

	finished 30 out of 40 lessons. Waiting for end-of-classes so that the recordings commence from 7 May to finish by June 2012.

**: Assumed Main Project Cost (equal to Funds released so far), no data obtained from MHRD*

17. Creating Accessible study material for print impaired student

Project Title	Creating Accessible study material for print impaired student
Name of Partner Institute (s)	IIT Kharagpur,
P.I & Co- P.I Name	Dr. Partha Pratim Chakrabarti and Dr. Anupam Basu
Deliverables (as per project Report)	Original DAISY Books about 200 numbers out of which about 120 numbers would be full text full audio DAISY. Modified: DAISY Books 168 numbers out of which 102 numbers would be full text full audio DAISY.
Main Project Cost	53 Lakhs
Funds released so far	53 lakhs as on 16 March 2010
Progress as on date	Project completed to a large extent. Through this pilot phase, an understanding of the actual problem has been achieved and a modified proposal based on these findings will be submitted by IIT Kharagpur.

18. E-books on material science & engineering

Project Title	E book on material science & Engineering
Name of Partner Institute (s)	Indian Institute of Technology, Kanpur
P.I & Co- P.I Name	Dr Anandh Subramaniam Dr. Kantesh Balani

Deliverables (as per project Report)	E books on material science & Engineering(the books will contain 3D perspective) with the following subtopics:- 1st Year: E-book on material Science E-tutorial on material Science E-Lab on material Science
Main Project Cost	32.31 Lakhs (Pilot Project)
Funds released so far	PAB of NMEICT has approved Rs.32.21 Lakhs in its 7th meeting on 2nd July 2009 IFD has approved 32.31 Lakhs on 25.11.09
Progress as on date	Deliverables as per original proposal completed. E-book completed and presented. Available at IIT Kanpur website.

19. Learning by Doing (LBD) based course content development – IIIT, Hyderabad

Project Title	Learning by Doing (LBD) based course content development
Name of Partner Institute (s)	International Institute of Information Technology, Hyderabad
P.I & Co- P.I Name	Dr. Sandhya Kode Dr. Kannan Srinathan
Deliverables (as per project Report)	To set up digital content in the CS and ECE field using the learning by doing approach
Main Project Cost	119 Lakhs + 30 Lakhs (Pilot Project)
Funds released so far	PAB of NMEICT has approved Rs.30 Lakhs in its 10th meeting on 25.10.2009 IFD has approved this amount 06.01.2010 1st Installment: 30 Lakhs as on 03.03.2010

Progress as on date	We are doing course development for 17 courses and are awaiting funds for the same. Kindly process the release of funds so that project can progress at a good pace.

20. Content generation for UG course in Agriculture Entomology –

CSK, Palampur, HP

Project Title	Content generation for UG course in Agriculture Entomology
Name of Partner Institute (s)	CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur HP
P.I & Co- P.I Name	Dr. Ajay K Sood, Dr. Pankaj Sood, Dr. PC Sharma
Deliverables (as per project Report)	✓ Development of digitized course material on Agriculture Entomology for e learning ✓ Video content digitization of hands on practice training in Agriculture Entomology
Main Project Cost	Rs. 25 Lakhs*
Funds released so far	PAB of NMEICT has approved Rs. 25 lakhs in its 7th meeting held on 2nd July 2009
Progress as on date	It is stated that this project couldn't be implemented for the want of revalidation of funds. This is for kind information and necessary action, please.

**: Assumed Main Project Cost (equal to Funds released so far), no data obtained from MHRD*

21. E-Content generation and delivery management of student centric learning

Project Title	E-Content generation and delivery management of student centric learning
Name of Partner Institute (s)	NIT Warangal
P.I & Co- P.I Name	Prof DVLN Somayajulu Prof B B Amberker

Deliverables (as per project Report)	Student centric content generation of 36 subjects Development of a software matrix to drive the content and integrated the software with 36 content modules Training teachers of engineering colleges Managing services: Remote handling of content services for integrated colleges from the central website
Main Project Cost	Rs. 168 Lakhs + Rs. 21 Lakhs (Pilot Project)
Funds released so far	PAB of NMEICT has approved Rs.21 lakhs in the 9th meeting held on 3rd & 11th sept 2009. IFD has approved 21 lakhs for three courses, released the grant on 12.02.2010
Progress as on date	Developed e-content for three courses as part of pilot phase work Submitted proposal to develop e-content for 24 courses in main phase

22. Mathematical Science without walls

Project Title	Mathematical Science without walls
Name of Partner Institute (s)	Mathematical Science Institute , Chennai
P.I & Co- P.I Name	Dr. Ramanujam
Deliverables (as per project Report)	Deliverables in Pilot Project ✓ Infrastructure creation at IMSC ✓ Preparation of 1 course each by the three groups: mathematics ,theoretical computer science & Theoretical Physics ✓ Travel by faculty to other institute to popularize this effort
Main Project Cost	Data not available.
Funds released so far	PAB of NMEICT has approved Rs. 18.30 lakhs for a pilot

	project in its 9th meeting held on 3rd & 11th sept. 2009 IFD Has approved this amount 1st installment: Rs. 18.30 Lakhs on 30 Aug 2010
Progress as on date	Recordings have been completed.

A3.1.2 Minor or Small Projects

1. e-Content generation and sharing laboratory

Project Title	e-Content generation and sharing laboratory
Name of Partner Institute (s)	Indian Institute of Technology , Mumbai
P.I & Co- P.I Name	Shishir k Jha N S Gopalkrishnan
Deliverables (as per project Report)	✓ Open text book project for UG Engineering students ✓ Audio Video e Book generation ✓ Provide an adequate response for addressing the head of sharing content within the context of Indian copyright law
Main Project Cost	Data not available.
Funds released so far	PAB of NMEICT has approved 17.16 lakhs in its 9th meeting IFD has approved this amount
Progress as on date	PI has so far not provided any update on the project.

2. E-content generation for courses on Liver stock production & management, Animal genetics and breeding

Project Title	E- content generation for the courses on Liver stock production and management

	E- Content generation for the courses on Animal genetics and breeding
Name of Partner Institute (s)	NTR College of veterinary science Amrita university Dayalbagh Educational Institute IIIT Allahabad
P.I & Co- P.I Name	Dr. R M V Prasad Dr. P jaya laxmi
Deliverables (as per project Report)	Development of the infrastructure required for generation of electronic learning content Collection an consolidation of the course material of all the 3 courses and completion of generation of 1 of three course E content generation of 2 courses as detailed in the deliverables Deliverables for e- content generation for the courses on Animal genetics , breeding and biostatistics Bio statics and computer application Principals of Animal genetics and Population Genetics Live stock and Poultry breeding
Main Project Cost	Data not available.
Funds released so far	PAB of NMEICT has approved Rs.16.5 Lakhs Sanctioned for Pilot Projects for both the projects together 1st Installment granted on 21.05.2010 of amount 16.50 Lakhs
Progress as on date	Video recording of lectures : Identified 15 x 2 =30 Completed

3. Courseware e-content development, Climate Change

Project Title	Courseware e-content development, Climate Change
Name of Partner Institute (s)	Anna University
P.I & Co- P.I Name	Dr. I. ARUL ARAM, Ms. Bandita Panda
Deliverables (as per project Report)	1. Adaptive Capacity to Sea Level Rise 2. Noise Pollution 3. Plastic Pollution 4. Environmental Management Systems 5. Essential of Eco-Systems 6. Solar Energy 7. Wind Energy 8. Simply city 9. Solid waste management
Main Project Cost	Rs.56 Lakhs
Funds released so far	Rs.14 Lakhs.
Progress as on date	Progress 60% coursework of 2 courses completed, Expected date of completion mid-May 2012. We are planning to complete around 21 e-content (lecture-based) programmes on Environment Science by this month and a documentary (Beach Cleaning) which is 75% complete. Some of the programmes are booked for presenting and the dates were scheduled. By now we are in the process of completing around 12 programmes and 9 programmes are scheduled to be completed this month. The e-Content is 50% complete for three programmes and there are about 7 programmes to be completed by this month. Funds arrived only in December 2011, and it took a month more to get administrative sanction from our University office.

4. Development of e-content in the areas of Insurance & Risk Management

Project Title	Development of e- content in the areas of Insurance & Risk management MBA(Agri Business)

Name of Partner Institute (s)	FMS , BHU Varansi
P.I & Co- P.I Name	Dr. SK Singh Dr. Rekha Prasad Dr. HP Mathur Dr. Abhijeet Singh
Deliverables (as per project Report)	**1st Year:** covers 1280 courses for MBA **2nd Year:** covers 1880 e courses for MBA & MBA(Agri) A total of 3160 e course would be developed for 79 subjects for MBA, MBA(Agri)
Main Project Cost	Rs. 553 Lakhs
Funds released so far	PAB of NMEICT has approved Rs 7*2 =14 lakhs in its 2nd and 16th meeting held on 1.09.10 for 2 courses as pilot in Phase 1 IFD has approved release of Rs 14 lakhs 1st installment: Rs. 14 lakhs on 21.12.2010
Progress as on date	Theoretical content of the 2 papers is almost ready along with periodic review of prepared content but the electronic content development process has not started due to inaccessibility of funds of Rs. 14 Lakhs transferred to BHU

5. Development of e- content in the areas of physical education for UG & PG course

Project Title	Development of e- content in the areas of physical education for UG & PG course Anatomy & Physiology Kinesiology of body movement

Name of Partner Institute (s)	Aligarh Muslim University, Aligarh
P.I & Co- P.I Name	Syed Tariq Murtaza Aaditeshwar Seth
Deliverables (as per project Report)	March 2012 2010 - 5 course 2011 - 5 course 2012 - 5 course
Main Project Cost	Rs. 1240 Lakhs
Funds released so far	PAB of NMEICT has approved Rs 7*2 =14 lakhs in its 2nd and 16th meeting held on 1.09.10 for 2 courses as pilot in Phase 1 IFD has approved release of Rs 14 lakhs 1st installment: Rs. 14 lakhs on 21.12.2010
Progress as on date	Major project work is completed, notes preparation is in pipeline.

6. E content for 4 courses of the Diploma programme in e content production

Project Title	E content for 4 courses of the Diploma program me in e content production
Name of Partner Institute (s)	Tamil Nadu open University
P.I & Co- P.I Name	Dr. S. Arulselvan
Deliverables (as per project Report)	✓ Introduction to e learning ✓ Multimedia production ✓ Instructional design Courseware designing
Main Project Cost	Rs 14 Lakhs (Pilot Project)

Funds released so far	Rs 14 Lakhs
Progress as on date	Progress report on the project has so far not been received from PI.

7. E- Content development of marketing management

Project Title	E- Content development of marketing management
Name of Partner Institute (s)	Bhavanagar University
P.I & Co- P.I Name	Dr. jaydeep M Badiyani
Deliverables (as per project Report)	Marketing Management for students of management(MBA Program) Marketing management for students of commerce
Main Project Cost	14 lakhs (Pilot Project)
Funds released so far	PAB of NMEICT has approved 14 lakhs in its meeting held on 15.03.2011 1st installment: Rs. 14 lakhs as on 1.07.2011
Progress as on date	e-content production upto 45% completed so far.

8. Introduction to high energy physics, introduction to Astroparticle physics and instrumentation methods in Astro partical physics

Project Title	E books on Introduction to high energy physics, introduction to Astroparticle physics and instrumentation methods in Astropartical physics
Name of Partner Institute (s)	IIT Rajsathan
P.I & Co- P.I Name	Dr. Sonali Bhatnagar
Deliverables (as per project Report)	Generation of e content for 2 courses ✓ High Energy Physics ✓ Introduction to astroparticle physics
Main Project Cost	Data not available.

Funds released so far	PAB of NMEICT has approved Rs 7*2 =14 lakhs in its 2nd and 16th meeting held on 1.09.10 1st installment: Rs. 14 lakhs on 6th jan 2011
Progress as on date	Work in progress, completed date for the present stage of the project: Sept 2012

9. To Prepare e- content & Videos in the area of manufacturing Technology for UG & PG Students and industry Users

Project Title	To Prepare e- content & Videos in the area of manufacturing Technology for UG & PG Students and industry Users
Name of Partner Institute (s)	BHU, Varanasi
P.I & Co- P.I Name	Dr. Santosh Kumar
Deliverables (as per project Report)	2 e-contents courses in the following fields • Mechanics of Metal Forming • Technology of Metal forming processes
Main Project Cost	14 lakhs (Pilot Project)
Funds released so far	PAB of NMEICT has approved Rs.14 lakhs for 2 course PAB has approved this project in its 10th meeting held on 29.11.2009 IFD has approved this amount for above project held on 29.10.2009 Funds received Rs.14 Lakhs
Progress as on date	I have completed the full (20 Lectures) and more for the first course on1. e- content for ' Mechanics of metal forming' . The second course on 'Technology of Metal forming' will be made ready by March 31st, 2012. However on safer side it will be submitted by April 30, 2012. The second course will be made only for 20 lectures.

10. Development of e-content on ancient Indian metallurgy & modern process metallurgy

Project Title	Development of e-content on ancient Indian metallurgy & modern process metallurgy
Name of Partner Institute (s)	IT BHU
P.I & Co- P.I Name	Dr. K. K. Singh
Deliverables (as per project Report)	Introduction: Linkage with Indian mythology, Archeological importance of iron objects found at various sites in India etc. About Iron makers of India: The people, locations, their culture, customs, rituals, social status, their motivation for the profession, their importance as iron maker etc. About the Process and Technology: The design and construction of furnace, raw materials, operation of furnace, chemical reactions, the product, further treatment and uses etc. Associated problems and challenges Relevance in modern technologies
Main Project Cost	Rs.12 Lakhs (Pilot Project)
Funds released so far	Rs.12 Lakhs
Progress as on date	Due to delay in equipment supply the project is delayed. However, we are trying our best to complete the project on revised scheduled time i.e., April 30 2012.

11. Development of e content for professional skill development in teacher training department of educational technology

Project Title	Development of e content for professional skill development in teacher training department of educational technology
Name of Partner	SNDIT Women's University, Mumbai

Institute (s)	
P.I & Co- P.I Name	JayaShree Shinde
Deliverables (as per project Report)	✓ Concept & Development: Educational Technology ✓ Systems Approach to education ✓ Process Of Communication ✓ Goal Setting and instructional objectives ✓ Content Analysis ✓ Evalution Strategies 1st Year: 3 Courses 2nd Year: 8 Courses 3rd Year: 7 Courses
Main Project Cost	Rs. 93,00,000/- + Rs. 10.33 Lakhs (Pilot Project)
Funds released so far	PAB of NMEICT has approved Rs 93.00 Lakhs for 360 hour's e content for 3 subjects 1st installment: Rs. 10.33lakhs on 22.02.2011
Progress as on End Feb. 2012	Pilot Project Content for one course of 40 hours of lectures and additional 10 hours of Content of Paper II shall be completed by March 31, 2012. Course contents are uploaded on SNDT website.

12. E content for video processing

Project Title	E content for video processing
Name of Partner Institute (s)	**IT , BHU**
P.I & Co- P.I Name	Dr. Sanjay kumar singh
Deliverables (as per project Report)	**1st Year:** ✓ Organization of e- contents ✓ Handout for introductory idea of the subject **2nd year:** ✓ Handouts for rest of the contents ✓ PPTS & PDF for the contents

	3rd Year: ✓ Animation of PPTs and PDF **4th year:** ✓ Advance topics and application area with animation Interlinking of PPTS , PDFs and videos
Main Project Cost	24 Lakhs
Funds released so far	PAB of NMEICT has approved Rs.9.60 lakhs for the pilot phase in the meeting held on sept 2009 1st Installment: 9.60 Lakhs on 23.02.2010, released by IFD.
Progress as on date	80% of pilot project work is complete. Likely completion date for the present stage of project is July 15, 2012

13. E course development in Economics

Project Title	E course development in Economics
Name of Partner Institute (s)	Annamalai University, TN
P.I & Co- P.I Name	Dr. T Sudha, Dr. N. Malathi, Dr. T. S. Kalyani
Deliverables (as per project Report)	To Develop e learning course material in integrated(UG & PG) Economics **2 Years(as per Proposal)** 1st year: 28 subjects which contains 700 e lessons 2nd Year: 42 Subjects which Contains 1050 e lessons
Main Project Cost	4.90 Crore
Funds released so far	Total Project Cost: 4.90 Crores PAB of NMEICT has approved Rs 7*1 =7 lakhs in its 2nd

	and 16th meeting held on 1.09.10 Amount proposed to relived= Rs 54 lakhs(30% of total project course) IFD has approved release of Rs 54 lakhs 1st installment: Rs. 7 lakhs on 5.10.2010
Progress as on date	Pilot project completed

14. E content for UG course in English language and literature

Project Title	E content for UG course in English language and literature
Name of Partner Institute (s)	Bhavnagar University, Gujarat
P.I & Co- P.I Name	Dr. Dilip Barad
Deliverables (as per project Report)	**Phase 1:** ✓ Identification of teachers & students from Gujarat state(Jan-Feb 2010) ✓ Planning of face to face and online workshop(March 2010) ✓ Workshop (April-Sept 2010) ✓ Preparing Model for e- content(Oct- Nov 2010) ✓ Testing of model e- content(Dec 2010) **Phase 2:** ✓ Preparing e content(Jan – April 2011) Testing and evaluation(may-June 2011
Main Project Cost	Data not available.
Funds released so far	PAB of NMEICT has approved Rs 7 Lakhs in its 11th meeting held on 4.12.2009 1st installment: Rs. 7 Lakhs on 18.02.2010
Progress as on date	The **Course content** for one semester is ready in textual format, uploaded on Google Docs, BharatWiki & Wikieducator (PDF printable) Aprox 60% work completed, Likely date of completion June 2012.

15. E content for zoology experiment

Project Title	E content for zoology experiment
Name of Partner Institute (s)	IIT GandhiNagar
P.I & Co- P.I Name	Dr. Nikunj Bhatt
Deliverables (as per project Report)	To provide digital facilities to students for studying zoology with 3D Virtual practical of protozones, lower invertebrates, dissections of higher invertebrates and vertebrates to revise with repeat facility
Main Project Cost	7 Lakhs (Pilot Project)
Funds released so far	Amount approved by PAB Rs. 7 Lakhs on 21.01.2011 1st Installment: 7 Lakhs in march 2011
Progress as on date	Modules are under preparation. Few modules will be uploaded by 30th April. Work in progress as per the DPR.

16. Developing e contents for Law Subjects

Project Title	Developing e contents for Law Subjects
Name of Partner Institute (s)	NAL SAR University of Law, Hyderabad
P.I & Co- P.I Name	Prof. B V somasekhar
Deliverables (as per project Report)	To develop e- contents in 159 Law Subjects
Main Project Cost	Data not available.
Funds released so far	PAB of NMEICT has approved Rs 7*1 =7 lakhs in its 2nd and 16th meeting held on 1.09.10 as pilot Project

	IFD has approved release of Rs 7 lakhs 1st installment: Rs. 7 lakhs on 21.12.2010
Progress as on date	Project report on the project has so far not been received from PI.

17. Development of simplified conceptual contents for self teaching on advance engineering topics

Project Title	Development of simplified conceptual contents for self teaching on advance engineering topics
Name of Partner Institute (s)	Indian Institute of Technology , Madras
P.I & Co- P.I Name	Shri V. Srinivasa Dhakravarthy Prof. G K Suraish Kumar Dr. N S Narayanaswamy Dr. Anil Prabhakar Dr. Arunn Narasimhan
Deliverables (as per project Report)	**1st Phase:** 5 Topics will be covered, part of this content will be translated in to Telugu & Tamil **2nd Phase:** More topics will be included and will be translated in to more Indian Language
Main Project Cost	Data not available.
Funds released so far	PAB of NMEICT has approved Rs. 7 Lakhs in its 9th meeting held on 3rd & 11th Sept 2009 IFD has approved this amount **1st installment**: 7 Lakhs on 13.05.2010

Progress as on date	Work in progress. Likely completion date for the present stage of the Project: June 30, 2012

18. Design & Development of next generation e content for software uses design patterns & framework

Project Title	Design & Development of next generation e content for software uses design patterns & framework
Name of Partner Institute (s)	IT BHU
P.I & Co- P.I Name	Manjari Gupta
Deliverables (as per project Report)	Ist year: i) Organization of the e-contents ii) Handouts for Introductory Idea of the subject IInd year: i) Handouts for rest of the contents ii) PPTs and PDF for the contents IIIrd year: i) Video lectures for Part-1(Design Patterns) IVth year: i) Video lectures for Part-2(Frameworks) ii) Interlinked PPTs, PDFs and Videos
Main Project Cost	13 lakhs + 7lakhs (Pilot Project)
Funds released so far	7 Lakhs
Progress as on date	Funds spent progress not clear.

19. Development of e- content for slope engineering

Project Title	Development of e- content for slope engineering
Name of Partner Institute (s)	IT , BHU
P.I & Co- P.I Name	Dr. Rajesh Kumar, Dr. G S P Singh
Deliverables (as per project Report)	Organization of the e content, acquisition of items and software preparation of basic contents of slope engineering Preparation of PPTS and PDFs for rock slope engineering Preparation of video lectures interlinked PPts , PDFs and

	videos Preparation of PPTs and PDFs for soil slope engineering Preparation of video lectures interlinked PPTs , PDFs and videos
Main Project Cost	22.8 Lakhs
Funds released so far	PAB of NMEICT has approved Rs.7 Lakhs for 1 course as pilot project in the 16th meeting held on 1st Sept. 2010 1st installment: 7 Lakhs as on 13th Dec . 2010
Progress as on date	Expected date of completion March 31, 2012.

20. Content generation for e learning on open source VLSI and embedded System tools

Project Title	E-content generation for students of Science in Graduate Programs As per PI the name of project is "E-Content for Undergraduate students in Biochemistry"
Name of Partner Institute (s)	Navrachna University, IITGN
P.I & Co- P.I Name	Dr. Madira Sikdar, Dr. Elizabeth Robin, Mr. K. K. Kumar, Ms. Darshee Baxi
Deliverables (as per project Report)	Need assessment is being conducted Preliminary module initiated on the basis of above Workshop with experts to be done shortly
Main Project Cost	7 Lakhs + 7 Lakhs (Pilot Project)
Funds released so far	Rs 5, 74, 000.
Progress as on date	Since the Chairperson, Navrachana University was available only after 26 March, 2012 the Bank account

	procedure could be initiated only after this period. Thus, the project could be commenced only after that date. However, we had initiated Project related tasks – the Project Fellow interviews were conducted during this phase and we were able to identify suitable candidates. The team has been engaged in the identification of target groups for need assessment and experts for the Workshop as outlined in the deliverables.

21. E- Content development for the course family and community resource management

Project Title	E- Content development for the course "family and community resource management"
Name of Partner Institute (s)	The Maharaja Sayajirao University Of Baroda, Gujarat
P.I & Co- P.I Name	Dr. Neeraj Jaiswal
Deliverables (as per project Report)	✓ Content generation ✓ Content validation ✓ Development of e- content ✓ e- content validation
Main Project Cost	Rs 733000
Funds released so far	PAB of NMEICT has approved 7 lakhs in its meeting held on 15.03.2011 1st installment: Rs. 7 lakhs as on 27.06.2011
Progress as on date	Because of the scarcity of the reliable professionals who meet our norms of time deadlines, payment patterns , budget and quality requirements, the process is taking comparatively more time. About 40% to 50% of coursework preparation is complete.

22. E content development for networking & web based e learning

Project Title	E content development for networking & web Based e learning
Name of Partner Institute (s)	CSK Himachal Pradesh
P.I & Co- P.I Name	Dr. S P Sharma
Deliverables (as per project Report)	E content development for ✓ Soil chemistry, soil fertility & nutrient management ✓ Angelology, Neurology & Aesthesiology
Main Project Cost	Data not available.
Funds released so far	1st installment: Rs. 7 lakhs on 30.12.2010
Progress as on date	It is stated that this project couldn't be implemented for the want of revalidation of funds. This is for favour of information and necessary action, please.

23. Design and development of interactive e- content for the subject digital image processing and machine vision

Project Title	Design and development of interactive e- content for the subject digital image processing and machine vision
Name of Partner Institute (s)	IT, BHU, Varansi
P.I & Co- P.I Name	Rajeev Srivastava
Deliverables (as per project Report)	✓ Requirement analysis and development of general framework of e-content for the subject : digital Image processing and machine Vision" ✓ Design and development of e- content ✓ Delivery of e- content of the subject
Main Project Cost	24 Lakhs
Funds released so far	PAB approved 6.50 lakhs for Pilot project in the meeting held on 23.02.2010

Progress as on date	70-75% of the e-contents complete. Pilot project is still in progress and will be completed by 30.6.2012

24. Developing the e content for training and development modules for managerial & non managerial personnel

Project Title	Developing the e content for training and development modules for managerial & non managerial personnel
Name of Partner Institute (s)	ISM Dhanbad
P.I & Co- P.I Name	Prof. Saumya Singh
Deliverables (as per project Report)	The course will relate existing theory & research in the area of OB with the practice and help the learner understand the behavioral dynamics in work organization
Main Project Cost	12.65 lakhs
Funds released so far	Amount approved by PAB – 6.30 lakhs in its 9th meeting held on 08.08.09
Progress as on date	Not provided, seems to be poor.

25. Development of e content on foundation course on analytical biochemistry and separation techniques

Project Title	Development of e content on foundation course on analytical biochemistry and separation techniques
Name of Partner Institute (s)	IIT Gandhinagar
P.I & Co- P.I Name	Dr. Charmy R Kothari
Deliverables (as per project Report)	To Develop basis theoretical and practical information of analytical bio chemistry and separation technique to UG students

	E content for 20 theory courseware & 20 practical's courseware
Main Project Cost	Rs. 6.4 Lakhs
Funds released so far	PAB of NMEICT has approved 6.0 lakhs in its meeting held on 24.01.2011
Progress as on date	Modules are under preparation. Few modules will be uploaded by 30th April. Work in progress as per the DPR.

26. Content generation for e learning on open source VLSI and embedded System tools

Project Title	Content generation for e learning on open source VLSI and embedded System tools
Name of Partner Institute (s)	National Institute of Science & Technology, Orissa
P.I & Co- P.I Name	Dr. Ajit Kumar Panda
Deliverables (as per project Report)	To deliver 16 courses of 480 hours (i.e each course of 30 Hours) using open source VLSI and embedded software Train the trainers through the workshop such that the students and teachers of the engineering community can use it and learn it without spending money **Main Project:** A portal of 16 audio video course Creation of 16 e- course books Creation of laboratory manuals approximately of 16 Nos. Creation of installation, configuration & help menu 4 workshops for teachers and students
Main Project Cost	52.4 Lakhs

Funds released so far	PAB of NMEICT has approved Rs 7 Lakhs in its 9th meeting IFD has approved this amount 1st Installment: 7.0 Lakhs(23.02.10)
Progress as on date	Work done so far: Magic and Irsim tool details are available Video has developed for Magic tools which include how to download, install, use the tool to develop simple VLSI Circuits. Manual is prepared for basic theory Manual is prepared for Magic and Irsim Case Studies are developed but not implemented No funds received.

27. Web based learning resources in OOP C++ & Data structures

Project Title	For creating web based learning resources in the subject of object oriented programming using c++ and data Structures for diploma level students
Name of Partner Institute (s)	Govt. Polytechnic – Hamirpur (HP)
P.I & Co- P.I Name	Rajesh Sharma
Deliverables (as per project Report)	Two Learning resources for diploma level students ✓ Object oriented programming using c++ ✓ Data Structure
Main Project Cost	10.15 Lakhs (Pilot Project)
Funds released so far	PAB of NMEICT has approved Rs 5.08 lakhs in its 11th meeting held on 4th Dec. 2009.
Progress as on date	Progress report from PI not received as on date.

28. Development of e-content for foundation course on Pharmaceutical Microbiology

Project Title	Development of e-content for foundation course on Pharmaceutical Microbiology
Name of Partner Institute (s)	IIT, Gandhinagar
P.I & Co- P.I Name	Dr. Navin Sheth Dr. Ramesh Kothari Mr. Chirantan Rawal Mr. Devendra Vaishnav
Deliverables (as per project Report)	To develop basic theoretical and practical information of Pharmaceutical biotechnology to UG students E contents for 30 theory courseware & 15 practical courseware
Main Project Cost	Rs 13.5 Lakhs
Funds released so far	PAB of NMEICT has approved 6.75 Lakhs in its meeting held on 24.01.2011 5 Lakhs from IIT Gandhinagar (SBI cheque no. 545253) dated 23rd March, 2012
Progress as on date	Modules are under preparation Few modules will be uploaded by 30 April Work is in progress as per DPR

29. Next generation e-content on numerical methods and its applications

Project Title	Next generation e-content on numerical methods and its applications.
Name of Partner Institute (s)	NIT , Patna

P.I & Co- P.I Name	Dr. Sawal kishore singh
Deliverables (as per project Report)	Organization of the e- content Handout for the introductory idea for the subject Handouts for rest of the contents PPTs and PDF for the contents Animation of PPTS and PDF where required Video Lectures for PART 1 Advance topics and application areas with animation Interlinking of PPTS , PDF and videos
Main Project Cost	24 Lakhs
Funds released so far	PAB of NMEICT has approved Rs. 5 Lakhs for pilot project in a meeting held on 3rd Sept.& 11th Sept. 1st installment: 5 Lakhs
Progress as on date	Course development in progress. Further release of funds required to complete the programme.

30. Next generation e- content for High performance computing

Project Title	Next generation e- content for High performance computing
Name of Partner Institute (s)	IT BHU, Varansi
P.I & Co- P.I Name	Ravi Shanker singh
Deliverables (as per project Report)	Organization of the e content Handouts for introductory idea of the subject Handouts for part- 1(Parallel Architecture) PPTS and PDFs for Part 1(Parallel Architecture) Videos Lectures for Part 1(Parallel Architecture)

	Handouts for part 2(Parallel Algorithm) PPTS and PDFs for Part 2(Parallel Algorithm) Videos Lecture for Part 2(Parallel Algorithm) Hands out for part 3(Parallel process) PPTS and PDFs for part 3 Video lectures for part 3 Interlinked PPTs ,PPTS and video
Main Project Cost	13 Lakhs (Pilot Project)
Funds released so far	PAB of NMEICT has approved Rs.4.75 Lakhs and Rs. 9.6 Lakhs respectively in the 3rd & 11th Sept 2009 1st installment : **4.75 Lakhs** on 23.02.2010
Progress as on date	Progress 80% completed.

A3.2 Connectivity

This section briefs all projects categorized into major and minor projects that targets the connectivity, which is one of the primary components of the Mission.

A3.2.1 Major or Large Projects

1. **Village community network technology development and pilot out plan for low cost opportunity communication network for rural areas of India**

Project Title	The village community network technology development and pilot out plan for low cost opportunity communication network for rural areas of india
Name of Partner Institute (s)	Dayalbagh Educational Institute, Agra
P.I & Co- P.I Name	Dr. SK Daya Prof. Satish Kumar
Main Project Cost	13.6 Crores

Funds released so far	PAB of NMEICT has approved Rs 6 Crores in its 2nd and 16th meeting held on 1.09.10 1st installment: Rs.3 Crores on 31.12.2010
Progress as on date	Project 60% completed.

2. VSAT, Mobile Integration

Project Title	VSAT , Mobile Integration
Name of Partner Institute (s)	IIT Roorkee DSCL , New Delhi IIM Ahmedabad
P.I & Co- P.I Name	Dr. H K Verma(IIT Roorkee), Dr. J. D. Sharma, Dr. H. Sinvhal, Dr. Vinod Kumar, Dr. Vinay Nangia Prof Rajnish Dass (IIM Ahmadabad) Mr. Rajiv Sinha(DSCL, New Delhi)
Deliverables (as per project Report)	Prototype of mobile e learning terminal Vans with custom designed body & Interior Equipment to be fitted in the Vans, including VSAT equipment Finished mobile –e learning terminals Network of universities/ institution Trained operators for mobile e learning Trail runs & Time Tuning Final deployment of mobile e learning terminals in the field
Main Project Cost	11.55 Crores
Funds released so far	3 Crores
Progress as on date	Project Completed.

3. Development of Low cost synchronization oscillators fro standalone communication network for efficient information broadcasting in geographically challenging location

Project Title	Development of Low cost synchronization oscillators fro standalone communication network for efficient information broadcasting in geographically challenging location
Name of Partner Institute (s)	DEI University Agra
P.I & Co- P.I Name	Dr. K Soami Daya Prof G S Tyagi
Deliverables (as per project Report)	➢ Development of Low cost thermally stable EBG(electromagnetic band gap) engineered, dielectric oscillators to serve as reference for communication networks for channel synchronization in the A- interface To use the noval EBG structure
Main Project Cost	290.6 Lakhs(As per Proposal) + 7 Lakhs (Pilot Project)
Funds released so far	Initial Grant by PAB on 3rd meeting held on 25.03.2009 was 1.0 crore 50 lakhs granted on 31.03.2009(as 1st installment) Progress report submitted by DEI on 23.09.2009 to NMEICT 50 lakhs granted on 09.02.2010(as 2nd installment)
Progress as on date	Project completed and the project completion report is submitted to Secretariat NME-ICT

A3.3 Access Device

This section briefs all projects categorized into major and minor projects that targets the access device, which is one of the primary components of the Mission.

3.3.1 Major or Large Projects

1. **Testing of Low Cost Access cum Computing devices, Hardware & Software optimization of Low Cost Access devices**

Project Title	Testing of Low Cost access cum computing devices Hardware & Software optimization of low cost Access Devices
Name of Partner Institute (s)	IIT Rajasthan
P.I & Co- P.I Name	Prof. Prem Kumar Kalra
Deliverables (as per project Report)	(a). Testing of Low-cost Access-cum Computing Devices (b). Hardware and Software optimization of Low-cost Access device (c) Establishment of Testing Facility.
Total Pilot Project Cost	47.72 Crores
Pilot Project Completion Date	31.03.2012
Main Project Cost	47.72 Crores
Funds released so far	Hardware & Software optimization of low cost access Devices Total Budget required: 10 Crores Testing of 1, 00,000 Low Cost Access Device Total budget Required: 20 Crore PAB of NMEICT has approved Rs 41.50 Crores in its 16th meeting held on 01.09.2009 1st installment: Rs.15 Crores(oct 2010)

	2nd installment: Rs. 10 Crores(10.12.2010) 3rd installment: Rs. 5.20 crores(30.03.2011) Total : 47.72 Crores
Progress as on date	Funds spent as on date Rs.23,76,43,430/- The total supply received so far is 6440 LCADs, against the required supply of 100,000 LCADs by December 15, 2011. Procurement of equipment as on date nil. The establishment of testing facilities, as has been mentioned already, is stalled due to problems beyond the control of IIT Rajasthan. This exercise will also be complete as soon as the agitation is under control Project closes on March 31, 2012, as per the approval for extension till March 31, 2012 given by the standing committee.

A3.4 Other Services

This section briefs all projects categorized into major and minor projects that targets the generation, which is one of the primary components of the Mission.

A3.4.1 Major or Large Projects

1. **Teachers empowerment, Students empowerment and integration of tools for empowerment (Synchronous delivery, "Talk to Teacher" project)**

Project Title	Teachers empowerment, Students empowerment and integration of tools for empowerment (Synchronous delivery), "Talk to Teacher" project.
Name of Partner Institute (s)	Indian Institute of Technology , Mumbai Amrita university Dayalbagh Educational Institute IIIT Allahabad
P.I & Co- P.I Name	IIT Mumbai Prof. Kannan Moudgalya IIIT Allahabad Prof. M. D. Tiwari

	Amrita University Prof. Kamal Bijlani Dayalbagh Prof. Satish Kumar Educational Institute
Deliverables (as per project Report)	**IIT Mumbai** • Student Empowerment ➢ IIT Mumbai Course- Free Of Cost ➢ Video on demand service through DTH, You Tube – Free Of Cost ➢ Web Services to support like online chat, learning management system module, interactive session between IIT Mumbai & remote location students ➢ E book support services • Teacher Empowerment ➢ To trained 1000 teachers in computer program ➢ Content creation ➢ Subject portal designed ➢ 50 seats class cum lab facility with PC , Server **IIIT Allahabad** ➢ Contents in field of Information Technology ➢ Workshop of Teachers ➢ Workshop of Experts ➢ Developing Web Portal(Gyan Sangam) ➢ Repository of audio & Video conversation **Amrita University** • Developing of e- teaching environment Talk to a teacher basic software, Teacher controlled interaction with students , synchronous document sharing **Dayalbagh Educational Institute** ➢ Three course in computer science ➢ Three course in Management
Main Project Cost	79.15crores + 9.25 Crores (Pilot Project)
Funds released so far	PAB of NMEICT has approved Rs.10 Crores in its 3rd meeting on 25.03.2009 IFD has approved release of 5 Crores 50% of Approved by PAB(2008-09) IFD has approved an amount of Rs. 5 Crores as second

	installment (2009-10) PAB in its 15th meeting held on24th May 2010 approved & released 30 % of the project Cost I.e 23.74 Crores
Progress as on date	Major goals achieved.

2. Development of open source LMS with ERP functions & integration of already available open source modules, for distribution under GNU/GPL for use of academic institution

Project Title	Development of open source LMS with ERP functions & integration of already available open source modules, for distribution under GNU/GPL for use of academic institution
Name of Partner Institute (s)	Indian Institute of Technology , Kanpur IIT Roorkee NIT , Hamirpur , HP DEI , Agra Amrita University IGNOU
P.I & Co- P.I Name	**IIT Kanpur,** Dr. yatindra nath Singh, Dr. Prem Kumar Kalra **IIT Roorkee,** Dr. SC Sexena **NIT Hamirpur,** Dr. Narottam Chand **Dayalbagh Educational Institute,** Dr. Prem Sevak Sudesh **Amrita University,** Dr. Venkat Rangal
Deliverables (as per project Report)	● Learning Management ● Student behaviour tracking and Visualization ● Time table management

	● Library manangement system ● Asset management system, tracking system with APIs to interface tracking devices. ● Project management system ● Grant management system ● Localization into regional languages ● Cloud API ● Security framework ● P2P Brihaspati-4. ● Service upgradation to Chaupal based storage cloud for all academic institutes. ● Upgrade to OpenID based authentication and authorisation ● Online academic registration system – to be made operational. ● Student portfolio management system. ● Parent notification and interaction system. ● Payroll, taxation and accouting system. ● BrihasptiSync – live lecture delivery system. ● Brihaspati websites – Content management system.
Main Project Cost	19.36 Crores + 2 Crores (Pilot Project)
Funds released so far	7.506 Crores
Progress as on date	Major objectives achieved, the PI seeks project extension by one year.

3. Virtual Technical University Concepts

Project Title	Virtual Technical University Concepts
Name of Partner Institute (s)	Indian Institute of Technology, Kanpur
P.I & Co- P.I Name	Prof. Sanjay G Dhande Prof Sanjay Mittal Prof Phalguni Gupta
Deliverables (as per project Report)	➢ Proposed to set up virtual Technical university ➢ VTU will provide course in distance education mode using flexible credit system ➢ The course contents will be developed for web based as well as vedio medium Main campus will be in delhi & 30 more off campus will be developed
Main Project Cost	356 Crores
Funds released so far	Granted 6 crores by PAB of NMEICT on 25.03.2009 3.0 crores granted (as 1st installement) on 31.03.2009 Unused funds returned to MHRD
Progress as on date	Prof. Dhande presented to NMEICT review committee his findings without any data support and concluded that VTU is not a desirable option. He suggested an educational foundation to oversee educational activities. Further studies have to be made.

4. Quantum & Nano computing Virtual Center

Project Title	Quantum & nano computing Virtual Center
Name of Partner Institute (s)	DEI University
P.I & Co- P.I Name	Dr. Vishal Sahni

Deliverables (as per project Report)	Indian Roadmap for Quantum Computation / Information being prepared on lines of American and European efforts Prototype of SQUID (Spintronix) Quantum Computer being developed Annual Winter School on Quantum-Nano Computing (QANSAS) being organized (2009, 2010, 2011 . .) for students / researchers Introductory books on the subject published in India Over 1000 students and researchers trained and the field seeded in India Over 100 video lectures digitized and uploaded on Project website indexed to Sakshat
Main Project Cost	4 Crores (Pilot Project)
Funds released so far	Total Project Cost: 4 crores PAB of NMEICT has approved Rs.2Crores in its 3rd meeting on 25.03.2009 1st installment : 1.0 crore on 31.03.2009 2nd installment: 1.0 crore on 16.12.2009 PAB has approved Rs. 5 crores for main said project in its 13th meeting held on 25.02.2010 1st installment of main project(30% of 5 crore i.e 1.5 crore) on 30.03.2010 Funds received Rs.3 Crores.
Progress as on date	Likely date of completion is **31 March 2013**. The formation of the Virtual Centre has provided a forum for exploring the exciting opportunities in these fields to budding young participants. Among the notable outcomes of the project is a fillip to quantum and Nano computing awareness, education and research between young groups in India. The video lectures developed under the project have been provided online to a much wider audience through an Internet based interface. This will enable a much wider audience to use the

	Quantum Computing devices developed under the Project and will provide immense contribution to the ICT Mission. Since several researchers in the field are setting up their own laboratories, their coming together under the common umbrella of a Centre has gone a long way in establishing a lasting bond between the intelligentsia.

5. Developing Suitable pedagogical methods for various classes, intellectual calibers & e learning

Project Title	Developing Suitable pedagogical methods for various classes, intellectual calibers & e learning
Name of Partner Institute (s)	Indian Institute of Technology , Kharagpur IIT Bombay, IIT Delhi, IIT Guwahati, IIT Kanpur, IIT Madras, IIT Roorkee, IT BHU, IGNOU, NCERT
P.I & Co- P.I Name	A K Rai
Deliverables (as per project Report)	Sample Outcomes-based Curriculum Document for B Tech Courses. First Research Review Report - After 6 months Identification of all team member and allocation of assignment – 3 months Conduct 20 Work Shops/ seminars across India – 6 months Establish major core hardware & software facilities – 6 months Develop first theoretical framework – 4 months Formulate tentative online development and review process – 4-6 months
Main Project Cost	5 Crores (Pilot project cost)
Funds released so far	5 Crores
Progress as on date	Major Deliverables: Sample Outcomes based Curriculum Document for B. Tech Courses. Sample Outcomes-based Curriculum Document for around 85 B Tech courses are

	almost complete to the planned level (22 unites out of 40 units). First Research Review Report - after 6 months completed and uploaded on project site http://pedagogy@iitkgp.ernet.in. Identification of all team members and allocation of assignments - 3 months. Completed and uploaded on project site. Please login to the site using your password and click on All users [TEMPORARY Login: course view, Password: course view 123]. Conduct 20 workshops/seminars across India – 6 month. Conducted 13 workshops/seminars across India without the VC facility. Establish major core hardware and software facilities – 6 months. Expecting VC facility all required H/W & S/W installed. Develop first theoretical framework – 4 months. Competed and uploaded on project site. Formulate tentative online development and review process - 4-6 months. Completed and uploaded on project site. Please see DOWNLOAD section.

6. Software Tools, Open Source Tools, Simulation Tools

Project Title	Software Tools, Open Source Tools, Simulation Tools
Name of Partner Institute (s)	Indian Institute of Technology , Roorkee IIT Mumbai Dayalbagh Educational Institute, Agra
P.I & Co- P.I Name	Dr. Hari Om Gupta, Dr. Vinod Kumar Dr. Surendra Kumar, Prof. N. P. Padhy
Deliverables (as per project Report)	To Create web based toolboxes for 1. Power System analysis 2. Power electronics & electric drive 3. Optimization techniques 4. Numerical analysis 5. Statistical Analysis 6. Digital signal & Image Processing

Main Project Cost	10 Crores (Pilot project cost)
Funds released so far	5 Crores (2 Crores to IIT Roorkee)
Progress as on date	86%, More than 150 models are available for the end users through the website. We hope that the complete project can be successfully launched during December 2012.

7. Creating Digital – learning Environment for design in India(e- Kalpa)

Project Title	Creating Digital – learning Environment for design in India(e- Kalpa)
Name of Partner Institute (s)	Indian Institute of Technology , Bombay NID Ahmedabad
P.I & Co- P.I Name	Ravi poovaiah, IIT Bombay Soumyajit Ghoshal, NID bangolore Ravi Mokashi IIt Guwahati
Deliverables (as per project Report)	✓ Digital on line content for learning design with distance e-learning ✓ Social networker for higher learning with collaborative learning space for design for synchronous & Asynchronous interaction ✓ Digital design resource database including the craft sector Design inputs for products of national mission in education
Main Project Cost	15 Crores
Funds released so far	PAB of NMEICT has approved Rs. 1.5 Crores to joint IIT Bombay for Pilot Phase 1st installment for main project : 1.5 Crores (2011) May 2011 – 2nd installment: 250 Lakhs **Total Rs.4.0 Crores**
Progress as on date	Work in fast progress. Completion of Phase I by March 31, 2012

8. Assimilation of open source software in science and engineering education

Project Title	Assimilation of open source software in science and engineering education
Name of Partner Institute (s)	Indian Institute of Technology , Mumbai
P.I & Co- P.I Name	Prof Prabhu Ramchandran Prof Mani Bhushan Prof Kannam M moudgalya Prof PSV natraj Prof G Sivakumar
Deliverables (as per project Report)	Video Courses E books Workshops conferences
Main Project Cost	5.97 Crore
Funds released so far	PAB of NMEICT has approved Rs.95 lakhs in its 18th meeting on 24.01.2011 PAB has recommended Rs. 192.50 lakhs fro 1st Year and Rs. 126 Lakhs for 2nd Year 1st installment: 95 Lakhs as on 16.03.2011
Progress as on date	Work in progress, Likely completion date for the present stage of the project: 31st December, 2012

9. Library Automation & Resource Sharing network

Project Title	Library Automation & Resource Sharing network
Name of Partner Institute (s)	IGNOU New Delhi
P.I & Co- P.I Name	Prof. Uma Kanji Lal Prof. k S Raghvan Dr. Parthasarathi mukho padhyay
Deliverables (as per project Report)	✓ Training of Librarians in library automation especially in open source library automation package KOHA ✓ Setting up a central database with KOHA installation on sakshat Server ✓ Support Libraries in Library Automation and feeding biblographics data in central KOHA database ✓ Collation of already existing database of INFLIBNET, DELNET to constitute a union resource base ✓ API implementation
Main Project Cost	1.82 Crores
Funds released so far	PAB of NMEICT has approved Rs 1.82 Crores in its 16th meeting held on 1st sept 2010 Amount proposed to released by PAB Rs. 54,60,000(30% Project Cost) 1st installment: Rs.54.60 lakhs as on 13.12.2010
Progress as on date	Work in progress, Likely date of completion December 2012 for the 1st Phase.

10. E Yantra: robot enhanced teaching of subjects in Engineering college

Project Title	E Yantra: robot enhanced teaching of subjects in Engineering college
Name of Partner	IIT Bombay

Institute (s)	
P.I & Co- P.I Name	Prof Kavi Arya
Deliverables (as per project Report)	✓ Successful development/ deployment of robotic platforms for enhanced education ✓ Open Courseware for embedded system for engineering student based on robots ✓ Web Based resources to support these course ware ✓ Deployment of 300 robots in 20 engineering colleges covering 3600 students in 1 Year itself
Main Project Cost	206.03 Lakhs
Funds released so far	Total Cost: 98.36 lakhs (As on proposal) for Pilot Phase PAB of NMEICT has approved Rs 1 Crore in its meeting held on 25.03.2009 1st installment: Rs.50 lakhs on 31st march 2009 2nd installment: Rs. 48.36 lakhs on 10th feb 2010 Total Cost: 206.03 lakhs(As on Proposal) for Main Project 1st installment: 61.80 Lakhs (30% of project cost)
Progress as on date	No information has been received from the PI

11. Text, transcription of technical video lectures and creation of searchable video index, metadata and online quizzes

Project Title	Text, transcription of technical video lectures and creation of searchable video index, metadata and online quizzes
Name of Partner Institute (s)	Indian Institute of Technology Madras
P.I & Co- P.I Name	Prof. Mangala Sunder Krishnan
Deliverables (as per project Report)	Transcript for 4000 or more video lecture developed in Phase I of NPTEL

	Edited, files indexed and codes for searching the video at multiple points Review and online question banks on more than 100 courses (video) A software tool that can do automated machine transcription of text for large number of new video files with an accuracy of 70% or more.
Main Project Cost	Rs. 311 Lakhs
Funds released so far	Rs. 311 Lakhs
Progress as on date	1. Accurately transcribe and certify text files with video images of all lectures from 4600 hours of video lectures. Approximately 92,000 print pages (A4) will be made available for online access. The text files will be certified by the faculty who developed the video courses. This will enable viewers to browse through authenticated text contents of 4,600 hours of engineering lessons in video and search for specific topics with the help of powerful search engines. Transcription of more than 4376 hours of video lectures has been completed Uploading on website – On going. 2. Every transcribed lecture is being time coded and indexed using technologies available on the net and standard text books. This will enable the user to point to a particular video segment through a single or a rapid keyword based search on all the 4600 or so hours of recorded material. When completed, this will also be the first time in technical education all over the world that such facilities and standard video based metadata are available on the internet for the entire science and engineering curriculum – on going.

12. Development of an Indian sign language recognition system for hearing impaired students of India

Project Title	Development of an Indian sign language recognition system for hearing impaired students of India
Name of Partner Institute (s)	IIT Guwahati

P.I & Co- P.I Name	Dr. Manas kamal Bhuyan Mr. Prabin Kumar Bora
Deliverables (as per project Report)	**Pilot Phase:** 1. Literature Study(study of wide varieties of sign language all over the India) 2. Creation of an Extensive database 3. Audio/Video Analysis 4. Generalized Platform for sign language Education **Main Phase:** 1. Development of Hand gesture Recognition module 2. Testing the hand gesture interface and gesture Animation System 3. Building the prototype Recognition System with full capability 4. Extension related to Indian classical dance education
Main Project Cost	237.86 Lakhs + 130 Lakhs (Pilot Project)
Funds released so far	Rs.1.3 Crores. PAB of NMEICT has approved Rs 1.30 Crores in its meeting held on 28.03.2009 1st installment: Rs.65 Lakhs (01.07.2010) 2nd installment: Rs. 65 Lakhs (29.04.11)
Progress as on date	Major parts of the objectives set for the pilot phase of the project have been achieved. Developed an online interactive framework for Indian Sign Language Education and Recognition. Till now the pilot phase work has been completed. Main Project can now be launched.

13. Benchmarking of information and communication Technology modules in Physics and Chemistry

Project Title	Benchmarking of information and communication Technology modules in Physics and Chemistry

Name of Partner Institute (s)	IIT Kanpur
P.I & Co- P.I Name	Prof . R K Thareja
Deliverables (as per project Report)	From 15 content providers in physics& 10 content providers in chemistry has provided 22 course contents in physics and 12 course contents in chemistry for the project activity
Main Project Cost	202.0 Lakhs
Funds released so far	1.01 Crore granted on 31.03.2009 (as 1st installment)
Progress as on date	*Data is not available.*

14. Creation of machine translation tools and resources for English to Dravidian languages

Project Title	Creation of machine translation tools and resources for English to Dravidian languages
Name of Partner Institute (s)	Amrita Vishwa vidyapeetham, coimbatore
P.I & Co- P.I Name	Dr.Pushpak Bhattacharya Dr. k narayana murthy Dr. soman KP Dr s Rajendram
Deliverables (as per project Report)	Developing machine translation tools and linguistic resources for English to Dravidian languages Developing teaching material corresponding to the tools Training of 500 faculties Developing a Dravidian word net required for translation
Main Project Cost	728.70 Lakhs
Funds released so far	PAB of NMEICT has approved Rs.1 Crore in its 3rd

	meeting on 25.03.2009 1st installment: 50 lakhs on 31.03.2009 2nd installment: 50 lakhs 03.02.2010 Total Rs.1 Crore.
Progress as on date	As per the Pilot study and DPR, developed prototype versions of 5 machine translation systems (English-Hindi, English-Tamil, English-Telugu, English-Malayalam English-Kannada) . English-Hindi, English-Tamil can be easily made as accurate as Google if enough funding is given. The project has come to standstill because of the lack of funding.

15. Synchronous Live Lecture Delivery System- Brihaspatisync

Project Title	Synchronous Live Lecture Delivery System- Brihaspatisync
Name of Partner Institute (s)	IIT Kanpur
P.I & Co- P.I Name	Dr. Y N Singh
Deliverables (as per project Report)	Question Bank Repository Maintenance and up gradation of SCORM compliance in Brihaspati-2 Multiple learning path editor tool Reflector- Component architecture design Nat traversal of Brihaspati- sync Client Training program to representative Study of reliability mechanism Accessibility guidelines study and planning IPV6 extension module for Brihaspati Reflector implementation
Main Project Cost	1.02 Crore

Funds released so far	PAB of NMEICT has approved 1.02 Crores Amount proposed to relived= Rs 30.60 Lakhs (30% of total project course) IFD has approved release of Rs 54 Lakhs 1st installment: Rs. 30.60 Lakhs on 24.06.2010
URL of website where the content/deliverables are located	http://brihsvn.iitk.ernet.in:8080/bribaspati/servlet/brihaspati
Progress as on date	*Data is not available.*

16. Technology for Analysis of Rare Knowledge Systems for Harmonious Advancement

Project Title	"Technology for Analysis of Rare Knowledge Systems for Harmonious Advancement (TARKSHYA).''
Name of Partner Institute (s)	Centre for Development of Advanced Computing, Bangalore
P.I & Co- P.I Name	Dr. P. Ramanujan
Deliverables (as per project Report)	Create appropriate tools, utilities & technological support for computerized Vedic knowledgebase creation, utilizing it for manuscript processing (transcription and analysis) and offer interdisciplinary academic programs for Sanskrit/Vedic scholars and computer scientists on Sanskrit informatics, computational linguistics, Manuscriptology (advanced) etc., at undergraduate and postgraduate levels

Main Project Cost	Not sanctioned yet
Funds released so far	Rs.50.00 Lakh. Received on 13.4.2010
Progress as on date	Content uploaded. Now, 80 hours of video lecture content from 41 scholars (mainly > 60 yrs) produced. Video Recording computer programs, tools and utilities, standards etc., as demos with explanation in Sanskrit for all disciplines - about 30 hrs; remaining.

17. Development of Low Cost mobile Robots- Robotica for Education

Project Title	Development of Low Cost mobile Robots- Robotica for Education
Name of Partner Institute (s)	IIT Rajasthan
P.I & Co- P.I Name	Dr. Swagat Kumar
Deliverables (as per project Report)	To resolve complex coordination task & explain various engineering concepts To Develop high end mobile robotic platforms based on single board computers Development of Low cost mobile robots Setting up virtual robotic lab for the masses Training & Workshop
Main Project Cost	5.33 Crore
Funds released so far	PAB of NMEICT has approved 46.74 lakhs in its 18th meeting 1st installment: Rs.46.74 lakhs as on 15.03.2011
Progress as on date	Work in progress, Likely completion date for the present stage of the Project: March 2013

18. Design of quality assessment tool for evaluation of quality of e-content

Project Title	Design of quality assessment tool for evaluation of quality of e-content
Name of Partner Institute (s)	CDAC- Hyderabad
P.I & Co- P.I Name	Sh. D K Jain, Mr. Sarat Chandra Babu
Deliverables (as per project Report)	✓ Development of a quality assessment manual for e-content through identification of appropriates standards or guidelines or best practices related to quality of e-content ✓ Development of web enabled automation tool for evaluation of quality of the content based on quality assessment manual for e- content **1st Year:** ✓ Report on deliberation with experts on content quality criteria ✓ Development of appropriate questionnaire for evolution content ✓ Software requirement specification **2nd Year:** ✓ Software design ✓ Development of software **3rd Year:** ✓ Development of software testing ✓ Evaluation
Main Project Cost	216.2 Lakhs
Funds released so far	1st installment : 36 lakhs on 10.02.2010
Progress as on date	**Project Completed** In this pilot project activity we tried to propose an assessment model for evaluating effectiveness of developed content. In this regard we have taken NMEICT's instructional strategy i.e., Four Quadrant approach as the base for moving ahead in understanding the required conformance criteria for assessing effectiveness of the content. In the process we put forward our proposed assessment manual for assessing effectivness of

	instructional elements and technical performance of the content along with possible methodologies for evaluation.

19. Use of open source software for teaching Mathematics

Project Title	Use of open source software for teaching Mathematics
Name of Partner Institute (s)	Bhaskaracharya Pratishthana, Pune.
P.I & Co- P.I Name	Prof. N. S. Gopala Krishnan Prof. S. A. KatreMrs. Manjusha S joshi
Deliverables (as per project Report)	Four National workshops on Free Open Source software were Conducted. Undergraduate level theory of Mathematics implemented using Scilab, SAGE etc. Math's Lab can be developed from these software, to help Students for understand Math's concepts.
Main Project Cost	33.85 Lakhs
Funds released so far	PAB of NMEICT has approved Rs. 33.85 lakhs in its 7th meeting on 2.07.2009 1st installment: 33.85 lakhs on 11.02.2010
Progress as on date	Only open source software were used in the workshops and related work. Tested by Teacher, students and research associates been used in the workshops. Software were distributed to all participants during workshops. Installation of these software had been done in hands on sessions. 54 video DVDs generated form 3 workshops. In all 1044

	participants. **Project Completed.**

20. Development of Analysis and indexing tools for harnessing educational videos

Project Title	Development of Analysis and indexing tools for harnessing educational videos
Name of Partner Institute (s)	IIT Rajasthan
P.I & Co- P.I Name	Dr. Gaurav Harit
Deliverables (as per project Report)	✓ A video platform for integrating video content produced by educational institute in order to help students all over the country to have free access to educational video of all universities ✓ Algorithms developed for components of contextual extraction of information from video and tools for repurposing videos will be available in open source for further research in india
Main Project Cost	1.05 Crore + 32.45 Lakhs (Pilot Project)
Funds released so far	PAB of NMEICT has approved 32.45 lakhs in its meeting held on 24.01.2011 1st installment: Rs. 9.73 lakhs as on 10.03.2011
Progress as on date	Work in progress.

21. Establishing e- training Environment for training Technical &Students

Project Title	Establishing e- training Environment for training Technical &Students(Creation of 4 Courses)
Name of Partner Institute (s)	National Institute of Technical Teachers Training & Research, Chennai
P.I & Co- P.I Name	Dr P Sivakumar Dr. G Kulanthaivel

Deliverables (as per project Report)	✓ To design and develop e learning environment ✓ To provide continuous , learning opportunities ✓ To train a large no. of teachers in pedagogical competencies, class room management , guidance and counseling ✓ To provide e learning opportunities ✓ To facilitate technical institution encourage teachers to utilize training opportunities ✓ To provide e learning resources in engineering course to students
Main Project Cost	Rs.28 Lakhs (Pilot Project)
Funds released so far	PAB of NMEICT has approved Rs.28 Lakhs for 4 courses in its 10th meeting on 29.10.2009
Progress as on date	The major objectives of the mission are achieved to a larger extent. Based on the inputs given at the standing committee meeting held on 02.02.2012, the refinement, modifications and corrections are being made. It is requested that the time for completion may be extended upto 30.06.2012.

22. U Share: Multi user real time shared access platform for remote experimentation

Project Title	U Share: Multi user real time shared access platform for remote experimentation
Name of Partner Institute (s)	Amrita Vishwa vidyapeetham
P.I & Co- P.I Name	Rakesh Peter
Deliverables (as per project Report)	Multi- user shared access platform with integrated hardware & software eco system to support wireless virtual lab experiment
Main Project Cost	*Data is not available.*
Funds released so far	PAB of NMEICT has approved Rs 25 lakhs as on meeting on 1st sept 2010. 1st installment: Rs. 25 lakhs on 12th may 2011

	The grant Aid will be routed through the IIT Delhi
Progress as on date	Progress report has not been received from the PI.

23. Planning E-literacy program for mission on literacy using ICT

Project Title	Planning E-literacy program for mission on literacy using ICT
Name of Partner Institute (s)	IIM Ahmedabad
P.I & Co- P.I Name	Prof. Rajanish Dass
Deliverables (as per project Report)	*Data is not available.*
Main Project Cost	10 Lakhs (Pilot Project)
Funds released so far	10 Lakhs Granted 5 Lakhs on 31.03.2009 (as 1st installment) Granted 5 lakhs on 09.02.2010(as 2nd installment)
Progress as on date	Data not available

A3.4.2 Minor or Small Projects

1. Development of modular robotic systems for education

Project Title	Development of modular robotic systems for education
Name of Partner Institute (s)	Indian Institute of Technology , Kanpur
P.I & Co- P.I Name	Dr. Ashish Dutta Dr. Anupam Saxena K S Venkatesh
Deliverables (as per project Report)	Development of modular robotic systems with 4 types of robots(mobile robots, walking robots, serial manipulators

	and robots for advanced application
Main Project Cost	No information/funds received from NMEICT
Funds released so far	PAB of NMEICT has approved Rs.16.4 Lakhs for 6 months IFD has approved an amount of Rs. 16.4 lakhs for 6 months
Progress as on date	Only pilot project received and completed.

2. e-Content application for real life learning application in soft computing & virtual laboratory

Project Title	e-Content application for real life learning application in soft computing & virtual laboratory
Name of Partner Institute (s)	ABV-IITM , Gwalior
P.I & Co- P.I Name	Dr. ANUPAM SHUKLA
Deliverables (as per project Report)	E-Content modules developed • Being content development is a major objective of this project, we successfully able to develop 3 modules of soft computing along with real life applications in areas of robotics, medical expert systems, image and speech recognition, etc. • The database has been developed for 403 subjects for multimodal biometrics which is useful for speech and speaker recognition. Multilingual speech database has also been developed. • A website www.vl.iiitm.in has been designed for the above project where all learning modules for Neural network, Fuzzy logic and Genetic algorithm along with the codes and help menu are provided for students to work in this area. • Established soft computing and expert system lab

	has been done for post graduate and research scholars Content development • Content development in the area of ANN, Fuzzy logic and genetic algorithm with their application software is completed. • Content in the form of presentations with PPT and appropriate application are prepared for various modules and made available to students and faculties with help menu. • A web platform for remote downloading / streaming of content of various courses. This will help faculties to refresh topics covered under the course in future and also can be disseminated effectively to their student community. Book website: http://anupamshukla.com/softcomputing/ Download link: http://ebookee.org/Real-Life-Applications-of-Soft-Computing_1066798.html
Main Project Cost	188.60 Lakh
Funds released so far	14 Lakhs
Progress as on date	I have completed my project and did final presentation as well as submit the report. The utilization certificate is also submitted.

3. Developing ICT based pedagogical practices for management accounting

Project Title	Developing ICT based pedagogical practices for management accounting
Name of Partner Institute (s)	Indian Institute of Technology, Gandhinagar
P.I & Co- P.I Name	Dr. Manoj Shah
Deliverables (as per project Report)	✓ To Produce theoretical and practical(accounting problem practices) materials and explanation of management, accounting for UG Students ✓ Content for 30 e –test manuals(web) & 20 video lectures
Main Project Cost	*Data is not available.*
Funds released so far	PAB of NMEICT has approved 7 Lakhs in its meeting held on 24.01.2011 1st installment: Rs. 7 lakhs as on March 2011
Progress as on date	Received quotations for non-recurring expenses and deciding outsourcing services

4. Up gradation of ICT –enabled High voltage laboratory at NIT, Duragapur

Project Title	Up gradation of ICT –enabled High voltage laboratory at NIT, Duragapur
Name of Partner Institute (s)	IIT Delhi
P.I & Co- P.I Name	Prof Nirmal kumar Roy
Deliverables (as per project Report)	7 Experiment to be done
Main Project Cost	Data not available.
Funds released so far	PAB has approved 7 lakhs amount in its 10th meeting held on 29th oct 2009

Progress as on date	Data not available.

5. GNU Khata

Project Title	**GNUKhata**
Name of Partner Institute (s)	IIT Bombay
P.I & Co- P.I Name	Data not available
Deliverables (as per project Report)	Data not available
Total Pilot Project Cost	6.90 Lakh
Main Project Cost	Data not available
Funds released so far	Data not available
Progress as on date	Progress report on the project has so far not been received from PI

6. Implementation of an automatic grading system for programming courses offered in Engineering college

Project Title	Implementation of an automatic grading system for programming courses offered in Engineering college
Name of Partner Institute (s)	Pondicherry Engineering college, pondicherry
P.I & Co- P.I Name	Dr. S. Kanmani
Deliverables (as per project Report)	✓ To Create & Deploy an automatic grading system of the student program developed in the programming course taught in B Tech ✓ To increase consistency and correctness of evaluation methodology in order to enhance the learning process of the subject ✓ To ease the overload and the strain caused by the repeated task of correcting the programming

	assignments for the teachers ✓ To experiment assignment of the programming exercise
Main Project Cost	*Data is not available.*
Funds released so far	PAB of NMEICT has approved rs. 5 Lakhs on its 11th meeting held on 4.12.2009. Amount should be routed through IIT Bombay. IFD has approved release of Rs 5 lakhs on 10.2.2010 1st installment: Rs. 5 lakhs on 12.03.2010
Progress as on date	Funds not received yet.

7. Production Management System

Project Title	Production Management System
Name of Partner Institute (s)	NIT Calicut, Kerla
P.I & Co- P.I Name	Dr. T Radha Raman
Deliverables (as per project Report)	To develop an interactive package/courseware for production management system for teaching learning process To understand the system dynamics of production planning and control system.
Main Project Cost	Rs. 81,8000
Funds released so far	PAB has approved Rs. 4 Lakhs for pilot project 1st installment: 4 Lakhs on 11 Feb 2010.
Progress as on date	As per recommendation of the SC, and discussions with Prof. Mangala Sunder, the recording and post recording work is being carried out at the NPTEL office of IIT Madras. The work is in progress.

Appendix 4: Percentage Funds Allocation Summary for NMEICT Projects

On the basis of the Executive Summary of list of approved projects obtained from the Mission Directorate working under MHRD, the Evaluation Committee did an analysis of the "Proposed Funds" vs "Approved Funds". Since funds approvals are made on the basis of progress of project, such an analysis is helpful to gauge the overall progress of the project. Data mentioned in this Appendix is plotted in the graphs (Figure 3.3 and 3.4) in Chapter 3.

A4.1 Minor Projects Summary

Minor Projects under the category "Content"				
S. No.	**Project Title**	**Organization**	**Proposed Funds**	**Approved Funds**
1	E-Content generation and sharing laboratory	IIT, Mumbai	17.16	17.16
2	E-content generation for courses on Liver stock production and management	NTR College of Veterinary Science, Amrita University	16.5	16.5
3	E-content development for courses on climate change	Anna University	56	14
4	Development of e-content in area of Insurance & Risk Management	FMS, BHU Varanasi	553	14
5	Development of e-content in area of physical education	Aligarh Muslim University	1240	14
6	E-content for 4 courses of Diploma programme in e-content production	Tamil Nadu Open University	14	14
7	E-content development for marketing management	Bhavnagar University	14	14
8	E-books on Introduction to high energy physics, etc.	IIT, Rajasthan	14	14
9	Prepare e-content and videos in area of manufacturing technology	BHU, Varanasi	14	14
10	Development of e-content on ancient Indian metallurgy	IT, BHU	12	12

11	Development of e-content for professional skill development in teacher training department of education technology	SNDIT Women University. Mumbai	103.33	10.33
12	E-content for video processing	IT, BHU	24	9.6
13	E-course development in economics	Annamalai University	490	7
14	E-content for UG course in English language and literature	Bhavnagar University	7	7
15	E-content for zoology experiment	IIT, Gandhinagar	7	7
16	Developing e-contents for Law subjects	NALSAR University of Law, Hyderabad	7	7
17	Development of simplified conceptual concepts for self teaching on advanced engineering topics	IIT, Madras	7	7
18	Design and development of next generation e-content for software uses design pattern and framework	IT, BHU	20	7
19	Development of e-content for slope engineering	IT, BHU	22.8	7
20	Content generation for e-learning on open source VLSI and Embedded Systems tools	NIST, Orissa	52.4	7
21	E-content development for the course family and community resource management	MS University, Baroda	7.33	7
22	E-content development for networking and web based e-learning	CSK, HP	7	7
23	Design and development of interactive e-content for digital image processing and machine vision	IT, BHU	24	6.5
24	Developing e-content for training and development for managerial and non-managerial personnel	ISM, Dhanbad	12.65	6.3
25	Development of e-content on foundation course on analytical biochemistry and separation techniques		6.4	6
26	Content generation for e-learning on open source VLSI and Embedded Systems tools	Navrachna University, IIT GN	14	5.74
27	Web based learning courses for object oriented programming using C++	Govt. Polytechnic, Hamirpur	10.15	5.08
28	Development of e-content for foundation course on Pharmaceutical Microbiology	IIT, Gandhinagar	13.5	5

29	Next generation e-content on numerical methods and its applications	NIT, Patna	24	5
30	Next generation e-content for High performance computing	IT, BHU	13	4.75
			2823.22	**277.96**

Minor Projects under the category "Other Services"				
S. No.	**Project Title**	**Organization**	**Proposed Funds**	**Approved Funds**
1	Development of modular robotic systems for education	IIT, Kanpur	16.4	16.4
2	e-Content application for real life learning application in soft computing	ABV-IITM, Gwalior	188.6	14
3	Developing ICT based pedagogical practices for management accounting	IIT, Gandhinagar	7	7
4	Upgradation of ICT enabled High voltage laboratory	IIT, Delhi	7	7
5	GNUKhata	IIT, Bombay	6.9	6.9
6	Implementation of an automatic grading system for programming courses offered in Engineering college	Pondicherry Engineering College	5	5
7	Production Management System	NIT, Calicut	8.18	4
			239.08	**60.3**

A4.2 Major Projects Summary

Major Projects under the category "Content"				
S. No.	**Project Title**	**Organization**	**Proposed Funds**	**Approved Funds**
1	Production of coureware for PG courses	UGC	84.00	84.00
2	Virtual lab under centrally sponsored scheme	IIT, Delhi	102.00	78.00
3	NPTEL (Phase II and III)	IIT, Madras	96.00	76.35
4	INFLIBNET	IIT, Delhi	55.11	55.11
5	Production of coureware for UG courses	CEC, UGC	54.00	11.90
6	National Programme on technology enhanced learning for social sciences and humanities	IGNOU, New Delhi	75.95	1.44
7	Development of Computerized Vocational Educational Modules and Use of Haptic devices for Training	Amrita University	4.49	1.25

8	Vocational course E-enabled with delivery through ICT and conversion to regional languages	DEI University Agra	16.10	1.00
9	E Content creation in the area of economics, mathematics, commerce, history, zoology & botony	Delhi University	1.00	1.00
10	Development of Vocational Education module and use of haptic devices	Mizorem University	4.95	1.00
11	OSCAR++	IIT, Bombay	4.84	0.90
12	UG Course content in cultural education, rural development, proficiency in Indian music, drawing & painting, etc.	DEI University Agra	7.05	0.75
13	E-content generation for post graduate program in environment science	Teri University	3.55	0.75
14	Expansion of Technology Enhanced Learning Initiatives	Visvesvaraya University	0.70	0.70
15	E Content Generation and E Skill test in specialized area of Information Technology	CDAC, Noida	1.82	0.54
16	Introduction to Programming & its Mathematical foundation	KMIT, Hyderabad	0.61	0.54
17	Creating Accessible study material for print impaired students	IIT, Kharagpur	1.06	0.53
18	E-Book on material science and engineering	IIT, Kanpur	0.32	0.32
19	Learning by Doing based course content development	IIIT, Hyderabad	1.49	0.30
20	Content generation for UG courses in Agriculture Entomology	CSK HP Agri University	0.25	0.25
21	E-Content generation and delivery mechanism for student centric learning	NIT, Warangal	1.89	0.21
22	Mathematical Science without walls	Mathematical Science Institute, Chennai	0.183	0.183
			517.36	**317.02**

Major Projects under the category "Connectivity"				
S. No.	**Project Title**	**Organization**	**Proposed Funds**	**Approved Funds**
1	Village Community Network Technology development and pilot out plan for low cost opportunity communication network for rural areas of India	DEI University Agra	6.00	6.00

2	VSAT & Mobile Integration	IIT, Roorkee	3.00	3.00
3	Development of Low Cost Synchronization oscillators for standalone communication network for efficient information broadcasting over geographically challenging location	DEI University Agra	1.00	1.00
			10.00	**10.00**

Major Projects under the category "Access Devices"				
S. No.	**Project Title**	**Organization**	**Proposed Funds**	**Approved Funds**
1	Testing of low cost access cum computing devices	IIT, Rajasthan	47.72	47.72

Major Projects under the category "Other Services"				
S. No.	**Project Title**	**Organization**	**Proposed Funds**	**Approved Funds**
1	Talk to Teacher	IIT, Bombay	88.40	64.82
2	Development of open source LMS	IIT, Kanpur	21.36	8.32
3	Virtual Technical University Concepts	IIT, Kanpur	7.00	7.00
4	Quantum & Nano Computing Virtual Center	DEI University Agra	356.00	6.00
5	Developing suitable pedagogical methods classes, intellectual calibers and e-learning	IIT, Kharagpur	5.00	5.00
6	Software Tools, Open Source Tools, Simulation tools	IIT, Roorkee	10.00	5.00
7	E Kalpa: Creating digital learning environment for design	IIT, Bombay	15.00	4.00
8	Assimilation of open source software in science and engineering education	IIT, Bombay	5.97	3.78
9	Library Automation and Resource Sharing Network	IGNOU, New Delhi	1.82	1.82
10	E Yantra: Robot enhanced teaching	IIT, Bombay	3.04	1.60
11	Text, transcription of technical video lectures and creation of searchable video index, metadata and online quizzes	IIT, Madras	1.57	1.57
12	Development of Indian sign language recognition system for hearing impaired students of India	IIT, Guwahati	3.67	1.30
13	Benchmarking of information and communication technology modules in Physics and Chemistry	IIT, Kanpur	3.17	1.01

14	Creation of machine translation tools and resources for English to Dravidian languages	Amrita Vishwa Vidyapeetham, Coimbatore	7.28	1.00
15	Synchronous Live Lecture Delivery System	IIT, Kanpur	1.02	0.54
16	Technology for Analysis of Rare Knowledge Systems for Harmonious Advancements	CDAC, Bangalore	0.50	0.50
17	Development of Low Cost mobile robots for education	IIT, Rajasthan	5.33	0.46
18	Design of quality assessment tool for evaluation of quality of e-content	CDAC, Hyderabad	2.52	0.36
19	Use of open source software for teaching Mathematics	Bhaskarcharya Prathishtana	0.33	0.33
20	Development of Analysis and indexing tools for harnessing educational videos	IIT, Rajasthan	1.38	0.32
21	Establishing e-training environment for technical training	National Institute of Technical Teachers Training & Research, Chennai	0.28	0.28
22	U Share: Multi user real time shared access platform for remote experimentation	Amrita Vishwa Vidyapeetham, Coimbatore	0.25	0.25
23	Planning E-literacy program for mission using ICT	IIM Ahmedabad	0.10	0.10
			540.99	**115.36**

Appendix 5: NPTEL Online Feedback Analysis

Even before the inception of NMEICT Mission, another National Level programme, under the name "National Programme on Technology Enhanced Learning (NPTEL, 2003)" had made significant contributions towards content creation in engineering, science and management studies. Although now this programme is merged with NMEICT Mission but it continues to maintain its own identity and activities. NPTEL initiative envisaged creation of content for 990+ web and video courses in all major branches of engineering, physical sciences both at the undergraduate and postgraduate levels and in management studies only at postgraduate level. As per the information available, 600 courses are available on NPTEL website (including link through SAKSHAT portal). The remaining 390+ courses are at various levels of development. While considerable progress has been made towards the target of 990+ courses, the projected target still remains to be reached. Since NPTEL programmes are already available on the Web and there is a considerable user base, it served as a good platform for obtaining user feedback and evaluating their utilities.

In order to understand the impact of NPTEL course contents on users, NPTEL website provides a link at its homepage (http://nptel.iitm.ac.in/feedback.php) asking users to voluntarily provide a feedback which is subsequently processed by the NPTEL project managers.

Considering the enormous contributions of NPTEL towards content generation, Evaluation Committee deemed it important to obtain feedback data from its PI. Given below is an analysis of the feedback data obtained on NPTEL course contents from around 1000 online users.

Feedback was obtained on various parameters, given below is a summary of the same.

A5.1 User Classification: What type of users gave feedback?

One of the first questions asked in the feedback form was to which category a user belongs to in order to ascertain who are typically using the NPTEL course contents. While on one hand it is encouraging to see that a majority of users accessing NPTEL course contents are learners from

academia (students, 59%) or working professionals (32%), but on other hand, only a small participation is from faculty, which is a cause of concern.

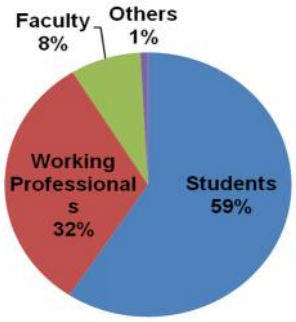

Figure A5.1: NPTEL User Classification

- A large proportion of users being student community suggest that students find NPTEL courses quite helpful in their coursework.

- Perhaps, if in the survey if student's college name is also asked, then a detailed categorization of student community can also be obtained in terms of students of which type of colleges (privately funded or Government run) are using the NPTEL course content most often. Besides it shall also help to know whether premier college students access NPTEL course contents or bulk of the visitors are from other colleges. This data will help in knowing even further the kind of audience that is gaining most of the NPTEL project.

- Less participation in terms of visits on NPTEL website by the teachers is a worrying sign because teachers, by the very nature of their job, can encourage a large number of students to use NPTEL course contents. However, with a very low usage of NPTEL among teaching community, the idea of teachers promoting NPTEL is quite dim.

- In this regard, it is also of extreme importance to know the root causes of teachers not visiting the NPTEL course contents. Perhaps, a teacher: student ratio of 1:10 may suggest that teaching proportion in the user profile of NPTEL shall remain low, however, it doesn't completely may be the root cause. Some other potential causes could be as below.

    - A teacher doesn't feel any value addition in viewing NPTEL course contents.

- If this is the case, then there is a need of value addition in NPTEL course contents which may happen by supplementing existing lectures with current state of the art of research, challenging project ideas, etc.

o A teacher is not motivated enough to walk an extra mile in updating himself / herself in exposition of subjects by expert faculty members through NPTEL course contents.

- If this is the case, then obviously a teacher is not self-motivated enough. Henceforth, there is a need to induce an external motivation for teachers in form awards, rewards, etc.

A5.2 Frequency of use: How frequently users refer NPTEL courses?

As evident from the figure below, it is good to know that most of the users who gave the feedback are the ones who use NPTEL quite frequently with 36% viewing it daily and 28% viewing it thrice a week.

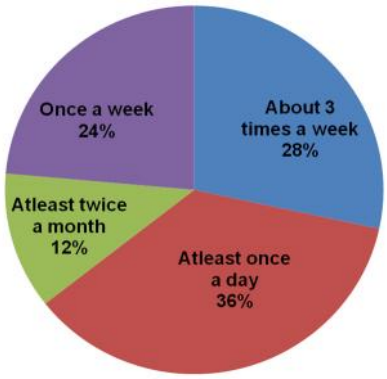

Figure A5.2: Frequency of use of NPTEL

Although this is a welcome trend to begin with, however, a more detailed analysis in this regard may be required like

- How often a user hits back at the same course during his/her visits to NPTEL website and to what extent a user is able to cover a course?

o It is important to know this data to put the above numbers of 36% viewing the content daily and 28% viewing it thrice a week, in a right perspective.

- In case it turns out that a user is hopping from one course to another during his / her visits, then it is suggestive of the fact that NPTEL course content is not able to generate a prolonged interest of student in a particular course and after some time, such users may completely lose interest in NPTEL project.

- What is the sustenance period, or in other words, if a user says he/she visits NPTEL website each day, then for how long he/she is able to maintain this frequency is an important factor to be ascertained?

  - This is important criteria in ascertaining the credibility of the high percentage of users visiting NPTEL website frequently.

  - If the sustenance period is small (few days/weeks), then the high percentage of user visits may be mislead into believing that the NPTEL project have frequent visitors, so it is making a good impact among learners.

A5.3 Purpose of use: What is the purpose of users for referring NPTEL courses?

Since NPTEL courses are structured around the academic curriculum, so it is not surprising to find users referring NPTEL course primarily for their academic needs, most important of which being the examination (34%). Also interestingly a significant percentage of students (29%) are using NPTEL course contents in preparing for competitive examinations.

Figure A5.3: Purpose of use of NPTEL courses

- However, it is a matter of common observation that majority of student study only few days before the examination. So, a high percentage of usage (63% = 34% + 29%) of NPTEL

courses towards examination preparation both academic and competitive may perhaps also indicate students may visit NPTEL course content only during the exam preparatory days.

- It would be more prudent that the number of students visit NPTEL course contents because of a genuine interest in the subject. In this regard, efforts are required to increase the number of such students who visit NPTEL only due to an interest from 23% to higher values.

A5.4 Syllabus Coverage: How close is NPTEL course syllabus to the Academic Course?

Most of the students have expressed that the course content uploaded on NPTEL is quite close to their academic course with 22% saying that it is almost the same syllabus and 54% saying that 80% is common. No doubt this is a good since it means that the likelihood of students visiting NPTEL increases if they find that they can cover most of the topics from NPTEL website.

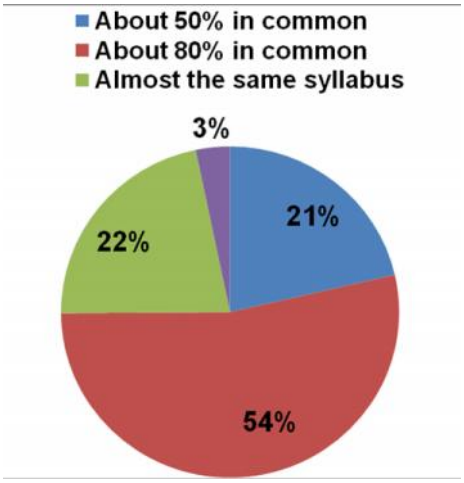

Figure A5.4: NPTEL Syllabus Coverage

- However, at the same time, it may be emphasized that efforts need to be made to bridge the gap between NPTEL course syllabus and academic syllabus by supplementing the NPTEL course content with further readings, perhaps from other sources.

  - One of the ways to do this is to have a feedback mechanism in place for each course wherein students may request information on topics not getting covered so that the faculty experts who have created the NPTEL course content may reply by adding further readings so that gap could be covered. To avoid any duplication of effort, this request-

reply feedback mechanism can be made open for viewing to all users who visit that specific NPTEL course contents.

A5.5 Course Coverage: How many number of NPTEL courses accessed?

20% users access 10 courses & more and another 20% access 5 – 10 courses suggests that users are making considerable use of NPTEL courses.

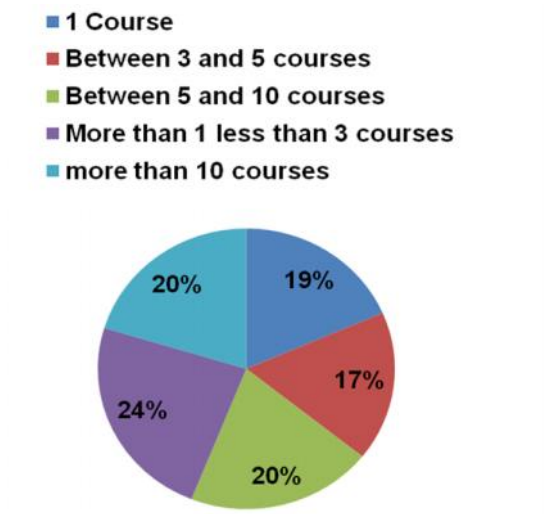

Figure A5.5: NPTEL Course coverage by users

However, having said that, it is also imperative to know further details of this usage to understand the real impact of the NPTEL course contents. Further questions that may be asked are as below.

- How many users viewed a course uploaded on NPTEL website in its entirety?
    - A common observation on NPTEL videos uploaded on YouTube is that number of visits on NPTEL course videos which are introductory lectures of the subject is very high as compared to the number of visits on subsequent lectures which are very less (and decreases by almost 10 times).
    - If the details of above information is also made available for NPTEL courses which offer only web contents (and no videos), then further insights on the usage can be obtained.

A5.6 Course Depth: What is the depth of the courses taught at NPTEL?

Majority of users (49% and 37%) believe that NPTEL courses cover considerable depth in the exposition of the subjects which is a very good trend.

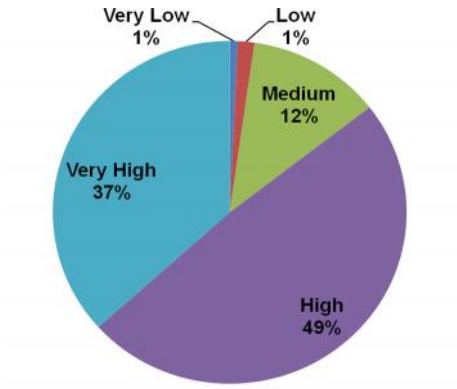

Figure A5.6: NPTEL Course depth

This trend is not surprising since typically each NPTEL course uploaded on its website has to have around 40 lecture hours of video which ensures that a course is covered in sufficient depth.

- More information needs to be obtained as to what are the courses and in what disciplines they belong to for which users feel that course coverage is medium (12%) so that they can be improved upon further.

- Although, significantly low percentage (2%) of users feels that few courses have low to very low course coverage, nevertheless, from an improvement standpoint, these are the courses that require perhaps a complete overhaul. These courses can be taken off from the NPTEL website and on improvement can be uploaded again.

A5.7 Course Explanation: Was the explanation sufficient to understand concepts?

Most of the users have been able to understand the concepts and have expressed the same in different ways with 17% users saying that they are able to understand. Another 21% and 25%

feel that course materials on NPTEL website are more than sufficient and sufficient for understanding a course, respectively.

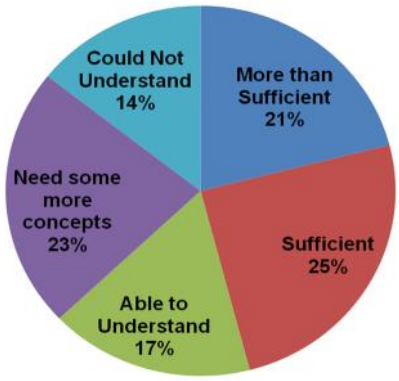

Figure A5.7: Course Explanation of NPTEL

However, at the same time a significant number of users (23%) require more concepts to understand the course and another 14% could not understand the course. Detailed information in this regard needs to be sought as given below.

- What are the courses in which users required more concepts to understand and what are the courses in which students are not able to understand?
- In case a user requires more concepts (23%), a more detailed feedback may be required to know what more concepts they require.
- In case a user is not able to understand a course (14%), again more information is required in regard to the reasons as to why they are unable to understand a course? This is very important since it will help the NPTEL course designers in knowing the shortcomings which may then be subsequently mitigated.

A5.8 Course Quality: What was the quality of video/audio & text/diagram of NPTEL courses?

From the standpoint of quality of video/audio and text/diagrams of NPTEL, an overwhelming majority suggests that it is either very clear (68%) or is clear enough to learn (29%).

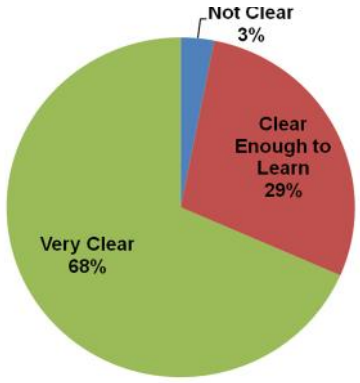

Figure A5.8: Quality of NPTEL courses

- Although a small percentage (3%), but when the scale of NPTEL videos are taken in considerations, then even this seemingly looking small value may translate to a significant number of video lectures.

- More information in this regard needs to be obtained from the users so that corrective measures are taken in improving the quality of video/audio and display of text and diagram in the video lectures.

A5.9 Course delivery pace: With what pace are the NPTEL course taught?

The pace with which a lecture is conducted has a pedagogical dimension attached to it. Even in a regular teaching, a teacher has to balance pace at which explanation of concepts is to be made based on the audience's receptivity and understanding. The advantage with regular teaching is that a teacher gets occasional explicit feedback wherein student may ask a teacher to slow down or fasten the explanation of topics and often a teacher can as well make out the if students are understanding or not in an implicit manner.

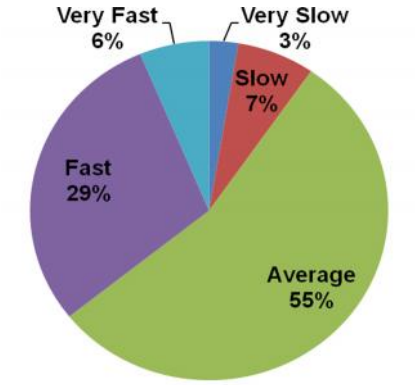

Figure A5.9: NPTEL Course delivery pace

However, this is not the case with expert faculty who develop course contents at NPTEL website. Since most of the faculty members are from premier colleges (IITs and IISc), so a natural bias is towards a rigorous and quick exposition of concepts. A significant percentage of users (29%) saying that courses are taught at a fast pace is therefore not surprising.

Additionally majority of the users have indicated that pace with which courses are taught at NPTEL website is average (55%). More information needs to be gathered to explain further the meaning by rating the course teaching pace to be average.

- Does average pace suggest appropriate pace? Or in other words, courses are taught at the right pace for understanding.
- Does average pace suggest that some concepts of a course are taught at high pace and some at low pace?
    - If this is the case, then such courses and the specific topics that need improvements may be identified.

A5.10 User participation: Are users interested to participate in online NPTEL discussions?

An overwhelming majority (95%) of the users are willing to participate in the online NPTEL discussion forums which suggest a great scope of peer-to-peer knowledge sharing and offline teacher-student interaction as well.

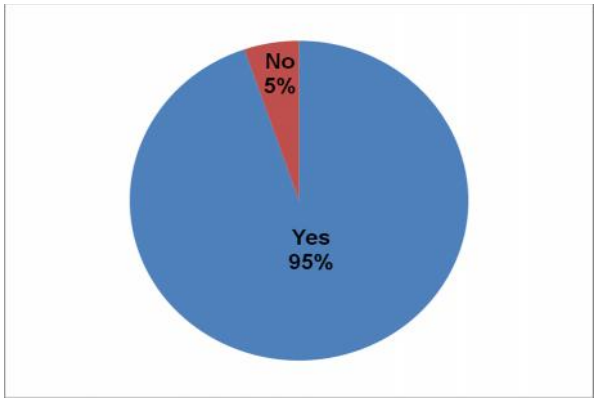

Figure A5.10: User participation in NPTEL

- In view of the above, it is suggested that a detailed feedback and knowledge sharing mechanism needs to be devised to encourage greater participation from learners.

A5.11 Summary

Given below is a summarized review of the Evaluation Committee.

- A more detailed data collection is required across most of the parameters in order to truly understand the impact of NPTEL course contents on learners and identify the areas of improvement.
- The task of collection of feedback needs to be allocated to a neutral party who is not directly involved in the NPTEL project.
- One of the effective methods of gathering an accurate feedback would be to mandate users to perform an online registration (free of cost) and only registered users would then be allowed access to the NPTEL course contents (video and web material).
    - This ensures that detailed web analytics on online user behavior can be performed at the backend completely oblivious to the users.
    - Some of the parameters (indicative list) of user behavior could be as follows.
        - Frequency of users visits

- Courses being visited
- Duration for which courses are visited
- Amount of lectures being covered by users

This would ensure an accurate feedback and the current process of taking an explicit feedback from users and then relying on a data entered by the users can be completely avoided.

Appendix 6: NPTEL Offline Feedback Analysis

In addition to the online feedback analysis done in Appendix 5 and considering the vast amount of e-contents available in public domain under the aegis of NPTEL, the Evaluation Committee decided to evaluate its widespread impact through its own process of evaluation.

In this regard, the Evaluation Committee designed a questionnaire and obtained feedback from three main perspectives –

- **Learner,** which may include student, faculty and anyone else who learns from the NPTEL courses.
- **Collaborator,** which include those experts (faculty members) who would wish to actively contribute to the NPTEL project by adding content.
- **Administrator,** who would administer the deployment and run of NPTEL courses.

Since the questionnaire was circulated among various colleges in an offline mode, this form of feedback is referred as *offline feedback.* Some of the significant observations are discussed below.

A6.1 Learner's perspective

Any user who views NPTEL project with intent to learn qualifies as a learner. With such a definition, students and faculty members both gets included.

Feedback was obtained from a pool of 45 learners. To target a diverse set of respondents, it was ensured that these learners are not from one particular college only. In this spirit, feedback was obtained from learners spread across 4 different engineering colleges.

Feedback was obtained on a scale of 1 to 10 (1 being lowest and 10 being highest) on the following parameters.

- The quality of available e-learning material is good.
- The guidance to facilitate learner's search for quality material is useful.

- The knowledge module and its content suits to the need of learners.
- The program is spreading digital literacy to empower teachers.
- The program provides sufficient e-knowledge contents, free of cost to Indian learners.
- The program has been on right track in identifying and nurturing the talent base of India.
- The mission is promoting holistic thinking in the learners so as to make them job creators rather than job seekers.
- Various psychological / personality tests provided are useful to the learners.
- The level of ill effects of internet / web based learning is low.
- Program is deriving lessons from our ancient knowledge base.
- Mission facilitates in improving teachers' training and course curriculum.
- Appropriate efforts have been taken to help physically challenged learners.
- Voice support for educational material delivery and interactivity for the content is good.
- There is multi-lingual content to facilitate the learners in their language.
- The available e-books / e-journals are useful.
- The mission is fine platform for sharing of ideas and techniques and pooling of knowledge resources.

Below is the summary of points obtained on above parameters. Parameters obtaining nearly similar points are combined together.

Quality of e-learning material, knowledge modules, digital literacy, free of cost availability, teacher's training, e-books, knowledge resource pooling.	8.15
Search for quality material, identifying & nurturing talent base, internet / web based learning, lessons from ancient knowledge	7.56

base, helping physically challenged learners, voice support for material delivery, multi-lingual content	
Holistic thinking in learners, psychological / personality tests	7.23

It is to be observed that all the parameters that are an essential "must-have" in a learning environment like the quality of e-learning material, knowledge modules, spreading digital literacy, free of cost availability, teacher's training, e-books, knowledge resource pooling, etc. are relatively given more points of the order of 8.15. This suggests that the primary objectives of learners are being met.

However, the parameters which enhance the content delivery (voice support for material delivery, multi-lingual content), searching for the right content, lessons from ancient knowledge base, helping physically challenged learners and identifying & nurturing talent base are given comparatively less points of the order of 7.56 which suggests some scope of improvements.

Lastly, parameters like developing holistic thinking in learners and provisioning of psychological / personality tests obtained the least points of the order of 7.23. These are certain areas that need to be addressed which impact the overall learning capacity of a learner.

A6.2 Collaborator's perspective

Any user who views NPTEL project with intent to collaborate with the expert faculty in actively contributing towards the course content development qualifies as a collaborator.

Feedback was obtained from 26 respondents from a collaborator's perspective. For a diversified pool of respondents, feedback was obtained from respondents spread across 3 different engineering colleges.

Feedback was obtained on a scale of 1 to 10 (1 being lowest and 10 being highest) on the following parameters.

- Mission provides a platform for developing knowledge network among and within institutions of higher learning in the country.
- The Mission attracts researchers of different field.

- The Mission is providing sufficient support in creating virtual technological universities.
- Mission is setting up virtual labs and lab centers and finishing schools for quality enhancement.
- Mission provides e-learning support to higher education institutions for technology assisted learning.
- There is a robust model of networking to encourage community participation at local levels.
- The e-journals in leading disciplines have good brand image.
- There is an appropriate provision for incentive based payment to the researchers publishing their high quality papers in e-journals.
- The Mission is successful in creating a large number of networks of experts in various fields.
- Mission attracts interested agencies working in the field of e-learning under one umbrella and establishing logical linkages between various activities.
- The Mission facilitates in capacity building and utilizing dormant capacities of various organizations.

Below is the summary of points obtained on above parameters. Parameters obtaining nearly similar points are combined together

Support in creating virtual technological universities, network of experts, e-learning & logical linkages	8.83
Developing knowledge network, mission attracts researchers, e-learning support, robust model of networking, capacity building & organization	8.47
virtual labs / lab centers / finishing schools, e-journals, incentive based payments	8.16

Feedback suggests that most of the respondents feel that NPTEL project shall facilitate in creating virtual technological universities, network of experts, e-learning & logical linkages, etc. These parameters have obtained points of the order of 8.83.

Besides these, it is also observed that parameters like developing knowledge networks, mission attracts researchers, e-learning support, robust model of networking, capacity building & organization are also given points of the order of 8.47 by the respondents which are an encouraging sign.

Finally, there are few parameters like virtual labs / lab centers / finishing schools, e-journals, incentive based payments, etc. where respondents have provided least comparative points of the order of 8.16 and henceforth are some of the areas that needs focus from a collaborator's standpoint.

A6.3 Administrator's perspective

Any user who shall potentially administer the deployment and use of NPTEL project qualifies as an administrator.

In this regard, feedback was obtained from 75 respondents (mostly faculty members) from an administrator's perspective. For a diversified pool of respondents, feedback was obtained from respondents spread across 4 different engineering colleges.

Feedback was obtained on a scale of 1 to 10 (1 being lowest and 10 being highest) on the following parameters.

- The quality assurance procedures and testing mechanisms for content generation is appropriate.
- Sufficient research on pedagogy is conducted to develop efficient learning modules.
- There is regular quality monitoring and standardization of contents to make them world class.
- Sufficient pilot projects are undertaken for experimentation and field trial for use of ICT in education.

- There is appropriate provision for certification of competencies of the human resources.
- The development and maintenance of the database of human resources is on track.
- There is proper coordination of knowledge activities among related ministries and organizations.
- There are adequate efforts for content and question generation.
- There is sufficient capability base available to handle the large user base.

Below is the summary of points obtained on above parameters. Parameters obtaining nearly similar points are combined together.

Quality monitoring & standardization, development & maintenance of HR database, efforts for content & question generation	7.53
Quality assurance procedures & testing mechanisms, research on pedagogy, proper coordination of knowledge activities, sufficient capability base	7.40
Pilot projects for use of ICT in education, provision of certification	7.18

Although, so far as administrative perspective is concerned there is some limitation of respondents in accurately providing the feedback due to lack of proper information especially for some parameters like coordination among related ministries, nevertheless, feedback on some other parameters may still be considered.

Most of the parameters like quality monitoring & standardization, development & maintenance of HR database, efforts for content & question generation, quality assurance procedures & testing mechanisms, research on pedagogy, etc. are obtained nearly similar points of the order of 7.53 and 7.40, however, comparatively, some other parameters like pilot projects for use of ICT in education, provision of certification, etc. are areas where respondents feel more emphasis is required in ensuring that NPTEL project's reach increases.

A6.4 Student's perspective

One of the most important stakeholders in the NPTEL project are students who are the eventual beneficiaries of this endeavor. Feedback was obtained from a pool of 41 students from a University Campus on following parameters and points in the range of 1-5 (Poor:1, Average:2, Good:3, Very Good:4 and Excellent:5) were obtained.

- What is the quality of course material?
- What is the value addition by the course content?
- How do you rate the quality of audio/video content in course modules?
- How are the courses contents organized and structured?
- Do you think that NPTEL project can replace classroom session?
- Any other suggestions / remarks.

Below is the summary of points obtained during the feedback on above mentioned parameters.

S. No.	Brief Description	Mean Rating (1-5)	Standard Deviation
1	Course Material	3.63	0.9153
2	Value Addition by Content	3.34	0.7940
3	Audio-Visual Content in Module	3.78	0.6896
4	Organization & Structure of Content	3.93	0.8482
5	Can replace classroom session?	**68% (No)**	**32% (Yes)**

Majority of students feel that course contents / materials are of very good quality with an average rating of 3.63 and a very good standard deviation of 0.9153. This also concurs with the view of faculty members in the learner's perspective feedback that by and large the course contents are of good quality.

A comparatively high rating of 3.78 by the students for the video/audio courses suggests that students appreciated video/audio based courses more that the course with only web content available. It is also indicative of the fact that the audio/video quality is also quite good.

Students gave the maximum rating of 3.93 towards the organization and structuring of the course contents which is also an encouraging sign with regard to facilitating learning among student community.

A comparatively low rating of 3.34 by the students could be explained by the fact that meritorious and top rank holders in a competitive examination are admitted to the University Campus engineering schools and henceforth, they require further insights in terms of current state of the art, research directions, etc. into the course content to appreciate value addition.

Interestingly, despite a rating of above good by the students, an overwhelming majority of them do not feel that NPTEL can replace the classroom session which emphasizes the fact that the NPTEL project supplements the conventional learning process and does not replaces the traditional process of classroom based learning.

Furthermore, students' suggestions are categorized and summarized below.

Interactive-ness & Delivery of Content

- Most of the students felt that much is desired in the user interface of NPTEL project and as it stands today, it is quite less user friendly. Moreover it is suggested that it be made more interactive and user community driven similar to the social networking sites like Facebook, LinkedIn, etc.

- There is no facility to download all pdf files related to a course in one time. As a result of this, it is at times cumbersome to download each file individually one at a time.

- Most students feel that there is no scope for doubt clarification which is one of the most important features of regular classroom teaching. Students feel that an option for Frequently Asked Questions (FAQs) for all courses can be made available to mitigate this deficiency to a large extent.

- There are no self evaluation questions in the form of MCQs, design problems, programming exercises, etc. for testing the knowledge acquired.
- A more detailed feedback is needed on per course per lecture basis so that pin-pointed queries can be raised and addressed by the expert faculty involved in developing the course contents.
- Video contents are far better in explaining the concepts than the web content since students feel that web content doesn't convey knowledge, rather they are only informative and also difficult to understand.
- Instead of using lectures with slides or PPTs, student have emphasized that concepts are explained with the conventional chalk / blackboard teaching. Besides, students also indicated that it is more interesting to view a recorded video lectures from a real classroom instead of studio recorded lectures.
- Video lectures should also be made available in audio format.
- Video lecture may have regional language converters or subtitles so that they could be understood in a better manner.
- Video quality needs to be improved for some lectures.

Ad-on Content

- Lack of additional supplementary links for further readings, descriptions of diagrams missing in some lectures.
- No practical component or lab related contents added.
- Non availability of solved exercises.
- Past year exam papers of the course could be uploaded as well.
- Tutorials and mathematical analysis should be there.
- Project ideas to be put up.

- More animations and related aids to be uploaded to enhance understanding.
- Current state of the art research of the course needs to be explained along with directions to move ahead on them.

Coordination & Outreach

- Lack of coordination between premier (IITs and IISc) and other colleges.
- Lack of awareness which affects participation
- No database of experts which could be leveraged by learners to coordinate with them.

Quality Standards

- Benchmarking the course contents

Miscellaneous

- Lack of availability of PCs to view NPTEL courses

A6.5 Summary

Summary of NPTEL project's feedback from various perspectives namely learner, collaborator, administrator and student is provided here.

Learner's Perspective			
Serial No. (as per Feedback Questionnaire)	**Brief Description**	**Rating (out of 10)**	**Analysis**
1	e-learning material	7.84	**Highly Rated**
3	knowledge module	7.93	
4	digital literacy	8.09	
5	e-knowledge contents	8.74	
11	teacher's training	7.81	
15	e-books	7.95	
16	pooling of knowledge resources	8.68	
	Average	**8.15**	

2	search for quality material	7.68	**Average Rated**
6	identifying & nurturing talent base	7.73	
9	internet / web based learning	7.42	
10	lessons from ancient knowledge base	7.50	
12	helping physically challenged learners	7.49	
13	voice support for material delivery	7.61	
14	multi-lingual content	7.50	
	Average	**7.56**	

7	holistic thinking in learners	7.28	**Low Rated**
8	psychological / personality tests	7.17	
	Average	**7.23**	

Collaborator's Perspective			
Serial No. (as per Feedback Questionnaire)	**Brief Description**	**Rating (out of 10)**	**Analysis**
3	support in creating virtual technological universities	8.96	**Highly Rated**
9	network of experts	8.69	
10	e-learning & logical linkages	8.83	
	Average	**8.83**	

1	developing knowledge network	8.54	**Average Rated**
2	mission attracts researchers	8.46	
5	e-learning support	8.46	
6	robust model of networking	8.40	
11	capacity building & organization	8.50	
	Average	**8.47**	

4	virtual labs / lab centers / finishing schools	8.25	**Low Rated**
7	e-journals	8.04	
8	incentive based payments	8.20	
	Average	**8.16**	

Administrator's Perspective			
Serial No. (as per Feedback Questionnaire)	**Brief Description**	**Rating (out of 10)**	**Analysis**
3	quality monitoring & standardization	7.58	**Highly Rated**
6	development & maintenance of HR database	7.53	
8	efforts for content & question generation	7.49	
	Average	**7.53**	
1	quality assurance procedures & testing mechanisms	7.34	**Average Rated**
2	research on pedagogy	7.36	
7	proper coordination of knowledge activities	7.45	
9	sufficient capability base	7.45	
	Average	**7.40**	
4	pilot projects for use of ICT in education	7.22	**Low Rated**
5	provision of certification	7.13	
	Average	**7.18**	

Student's Perspective			
S. No.	**Brief Description**	**Mean Rating**	**Standard Deviation**
1	Course Material	3.63	0.9153
2	Value Addition by Content	3.34	0.7940
3	Audio-Visual Content in Module	3.78	0.6896
4	Organization & Structure of Content	3.93	0.8482
5	Can replace classroom session?	**68% (No)**	**32% (Yes)**

Rating (Legend)	
1	Poor
2	Average
3	Good
4	Very Good
5	Excellent

Appendix 7: Response from IIT, Rajasthan and NMEICT Mission Directorate

A7.1 Response to the Questionnaire from NMEICT on LCAD

1. **How (and who) generated the low-cost device concept, initial design, fixation of cost line?**
   It was Mr. N.K. Sinha, IAS and Mission Director NMEICT who initiated the concept of the Low Cost Access cum Computing Device (LCAD).

   It was during a visit to MIT that the One Laptop per Child (OLPC) project was first seen. Subsequently, teams from OLPC visited MHRD. Mr. Sinha strongly believed that the product was not entirely suitable for Higher Education. He also believed that a product suitable for HE could be made at a price substantially lower than the price that OLPC was charging at that time. Mr. Sinha set a target price of US$ 35 (BOM Cost) with the intention that going forward, the price should drop to around US$ 10 per device while the functionality and specs should keep getting enhanced.

   In fact, the whole concept was developed using parallel teams of students, academics and industry partners. The driving force was that the development should be able to display all the content available on the Sakhsat portal for dissemination, within acceptable latency limits. There were various iterations of this process with at least four teams working in parallel to achieve acceptable levels of user satisfaction. As most people know, in the field of hardware, enormous innovation takes place constantly with the result that the latest generation of hardware commands premium pricing while the slightly older generations are available at a discounted price. The approach was to examine all available hardware including those components that might be one generation old, but were capable of delivering what was expected in the education domain. Thus, various experimental designs were developed and tested keeping cost of components in mind.

   The mission provided thought leadership, incubation, encouragement and guidance while the industry partners took care of cost of experimentation. In this manner, a few models got developed. When it became clear that it was technologically feasible to achieve production of such devices in and around the desired price-point, the project was sanctioned to IIT Rajasthan to procure (in conformity with GFR norms), get a supplier established, establish testing facilities and do further development and innovation etc.

   Thereafter, a series of discussions were held with manufacturers of such devices, as well as with the manufacturers of the various components. Given the (possible) very large requirement of such devices for education in India, it was felt that a much lower price-point could be achieved.

Mr. N.K. Sinha along with a few experts from IISc and various IITs and with inputs also from a group working at VIT then created a design for a typical Low Cost Access Device.

2. Who prepared detailed specs (SRS) of access device and when?

As member of this Committee would no doubt be aware, the term SRS typically refers to a Software Requirements Specification. A software requirements Specification (SRS) – a requirements specification for a software system – is a complete description of the behavior of a system to be developed and may include a set of use cases that describe interactions the users will have with the software. An SRS minimizes the time and effort required by developers to achieve desired goals and also minimizes the development cost. A SRS defines how an application will interact with system hardware, other programs and human users in a wide variety of real-world situations. Parameters such as operating speed, response time, availability, portability, maintainability, footprint, security and speed of recovery from adverse events are evaluated. Methods of defining an SRS are described by the IEEE (Institute of Electrical and Electronics Engineers) specification 830-1998.

To answer the question posed by the Committee, an SRS document for LCAD was not prepared, as it is not a software application.

In the case of hardware such as the LCAD (Low Cost Access cum Computing Device), detailed functional specs are prepared based on which the design is firmed up. Depending on the functionality required, various components are selected and the design populated accordingly.

Various brainstorming meetings were held at the office of Mr. N.K. Sinha to define the functionality requirements of a device meant for students and learners in the HE space. It was decided early on in the process that the operating system would be a free OS (like Linux/Unix/Android) to ensure that the cost of the OS license would not need to be added to the total cost. That was the time when Android was gaining popularity the world over and since Android is based on a Linux kernel, it seemed to fit well into the design.

The design philosophy that was followed was to enable the creation of a made-for-purpose device meant specifically for education. The result was a device meant for educational purposes at a price within the required parameters.

Once the functional requirements were defined, the next step was to see what kind of components would be best suited for such a device. Components require their own drivers and it was necessary to see that drivers were available for the selected components for the selected operating system.

This entire process was carried on in various sessions at Mr. Sinha's office at MHRD involving teams from different IITs and IISc as well as discussions with component vendors.

It was left to IIT Rajasthan, the institution tasked with the procurement and testing of the LCAD to prepare a formal detailed spec document before going for the EOI/RFP for procurement.

3. **Detailed design documentation of the device prepared by whom and when? (copy of the same to be provided, if any)**

It was expected that the institution that was provided funds by NMEICT for procurement, testing and further development of the LCAD would create a detailed design document of the LCAD as it existed at the time. However, the RFP issued by IIT Rajasthan carried only a basic functionality requirement along with an outline of the hardware requirements.

4. **Any copyright, patent or certification of correctness of design was done? If yes, when and by whom?**

The Mission does not have the technical resources to certify the correctness of the design. The Mission, therefore, provided funds to an IIT, with the expectation that the design would be validated before an RFP was issued for procurement.

As the members of this committee would no doubt be aware, a copyright is a form of protection provided to the authors of "original works of authorship" including literary, dramatic, musical, artistic, and certain other intellectual works, both published and unpublished. The copyright protects the form of expression rather than the subject matter of the writing. For example, a description of a machine could be copyrighted, but this would only prevent others from copying the description. A patent is granted for an invention and is the grant of a property right to the inventor.

In the case of the LCAD, the design proposed using existing generic components. The design also suggested that the device would be a 7" tablet without going into the specifics of whether it should have rounded or beveled edges or other details of that sort. It was left to the manufacturer of the device to decide specifically which make or model of the components were to be used and it would be the decision of the manufacturer whether to use some components to which they owned the patents.

It was expected that the institution to which funds were provided would move towards development of a SoC. Like with all other projects funded by NMEICT, the rights to all intellectual property developed by any institution utilizing MHRD funds would vest with

MHRD. However, NMEICT has no communication from IIT Rajasthan that they have created any IP.

5. **How much amount of money and time spent on conversion of design specs into a prototype model before launch? Who were the individuals and or institutions involved?**

The RFP issued by IIT Rajasthan required all bidders to provide samples of their devices. Since the bids had to conform to the specifications provided by NMEICT/IIT Rajasthan in the RFP document, it was expected that the devices tendered as samples would also conform to the requirements and hence would be prototypes of the required device.

NMEICT also understood that since this was the first time that such a low-cost made for purpose device was being manufactured, there would be many iterations before the design stabilised. The initial procurement was therefore limited to 100,000 devices so that the design could be stabilised and modifications made based on field-testing. The institution given the task of procurement was expected to play the role of a facilitator and work alongside the vendor selected by them, and being a technical institute, NMEICT expected the institute to provide hard-core technical inputs to improve the design.

The Mission did not spend any money on development of prototypes. As far as time is concerned, the iterations had been going on for nearly 5 years before the actual launch.

Since the prototypes were created by the various bidders/vendors, it is not possible for NMEICT to state how much time and money they spent in the creation of these prototypes.

6. **On what basis we can claim it to be an Indian design product?**

IIT Rajasthan was expected to set up design and testing facilities from the funds provided by them to NMEICT. However, as stated by them in various communications, they were unable to do so till the time they requested to be relieved of the project. Had IIT Rajasthan been able to fulfill the task given to them, hopefully, an Indian designed and Indian owned SoC and device would have emerged.

In the short time since the project has been transferred to IIT Bombay, various teams have been set up to work on both the software and hardware elements. Already, various software packages meant for education have been developed and integration exercises with various hardware platforms (like robots) are progressing.

The design of such devices is fairly standard. The expertise lies in defining functionality, creating a new System on Chip (SoC), selection of the correct components, and integration. NMEICT expects, based on discussions with the new PIs at IIT Bombay that

they have already begun work in collaboration with various processor and component vendors towards design of an Indian SoC.

7. EOI release for possible procurement of one lakh access devices and the information provided by IIT Raj or by others

Information on EOI, RFP and the entire process has been available in the public domain on the Sakshat portal since the time the project was initiated.

8. Verification, design and performance check of prototype model before formal release of bulk orders by whom and when?

IIT Rajasthan, as the procurement agency, issued an RFP for purchase of 100, 00 LCAD devices. The RFP required all bidders to submit prototype samples of the device that they were intending to supply. It is, therefore, IIT Rajasthan that would have done a performance check of the prototype model before formal release of bulk orders.

9. Performance verification of devices by IIT Rajasthan against what specs and by what standards?

The RFP issued by IIT Rajasthan did not, unfortunately, mention any parameters based on which devices supplied would be tested.

Based on various emails and letters exchanged between the supplier and IIT Rajasthan, it is learnt that when the supplier insisted on knowing the basis of acceptance and rejection of supplied devices and asked for a testing protocol to be provided to them that IIT Rajasthan first issued such a document. This was found to be largely based on an old HP test protocol for rugged devices. The supplier protested to IIT Rajasthan that far from being a rugged, mil-spec device, Aakash was a low-cost device and hence protocols meant for a rugged device could not be applied to such a low cost device. IIT Rajasthan then, after some time, released another test protocol. NMEICT is not aware whether IIT Rajasthan tested any devices based on this revised test protocol or not.

10. Status of development of Test facility at IIT Rajasthan? What are the components of test facility supposed to be setup as per the project proposal and their status?

The only information that NMEICT has on this issue is the statement by IIT Rajasthan that they have been unable to setup a test facility as required by the project. Further details can be asked for from IIT Rajasthan.

11. Basis for rejection of the supplied access device supplied by the vendor

Please see response to (9) above.

A7.2 **Response to the Questionnaire from IIT Rajasthan on LCAD**

IIT Rajasthan feels a deep sense of gratitude towards the opportunity to explain the doubts provided by the review committee. In the following sections of this document, in order to keep the response concise and to the point, we have taken the liberty of referring to the report dated February 27, 2012 submitted to Shri Sunil Bareja, Under Secretary, MHRD by IIT Rajasthan in response to the queries raised by MHRD through its letter **No.F. 16-05/2012-TEL** dated February 17, 2012. This report (referred to as *"the report"* hereinafter) is available for your kind consideration. We regret and apologise for any convenience due to these references. We have mentioned the page numbers of the specific references wherever possible.

1 Response to Queries

1. **How and who generated the low cost access device concept, initial design, fixation of cost line?**

The concept of the low-cost access device originated some 5-6 years back from now, when Government of India approached an organization to purchase large quantities of computing device at a cost of US$ 100, which later turned out to be US$ 150. Since the requirements in India were very large, the MHRD felt that such a device should be priced under US$ 50, with the ultimate goal of it being available at US$ 10.

In the meantime, there was a design of a printed circuit board-design project to realize low-cost computers that was carried out in IIT Kanpur by Prof. Kalra and his team. The on-paper design for it was provided by Mr. N. K. Sinha, Addl. Secretary, MHRD. At that time, the exact cost of production of the design was not known as it was carried out only for academic interest.

By 2009-10, there were a few organizations and start-up companies that were working on low-cost touch-enabled devices, but the exact cost of production was still unknown. IIT Rajasthan was one of these organizations.

A program was set up by MHRD under the NMEICT with the objective of designing and producing a functional computing device at an ex-factory cost of US$35/device. To this effect, Honourable Minster of HRD unveiled a device in the month of July 2010. The cost of this device was not known at that time, but it was expected to be around US$35.

To realize the device at the cost of approximately US$35, NMEICT awarded the project to IIT Rajasthan, Jodhpur in the later half of 2010, but a team at IIT Rajasthan was

already working on the low-cost access device concept since the early part of 2010. The tasks assigned under the project were:

(a) Procurement of 100,000 units of LCAD and their testing across the country.

(b) To create in-house testing facility

(c) Continuous development of LCAD to improve functionality and reduce the cost.

Most of the above stated facts can be found in in the MHRD newsletter dated November 20, 2011: http://mhrd.gov.in/sites/upload_files/mhrd/files/Newsletter-062011.pdf

2. **Who prepared detailed spec (SRS) of access device and when?**

The very first functional requirements on the capability of the device were provided to IIT Rajasthan by the NMEICT. An EOI document was worked out on these requirements by IIT Rajasthan in consultation with Mr. N. K. Sinha and MHRD, and was released in October 2010 through Sakshat portal and IIT Rajasthan website. The copy of the EOI can be found in ANNEX - 1 of this document. This EOI received response from 6 firms. A Bangalore based design start-up EAFT Technologies was selected by an International technical review committee constituted by IIT Rajasthan. This committee had representation from reputed Canadian, French and Indian academic institutions. The mission director, Shri Sinha also addressed the committee to apprise the committee about the mission goal and what was expected from the project. Apart from selecting the firm to complete the procurement, the committee categorically specified several conditions and mentioned check-points to ensure that the quality of the devices is not compromised in order to reduce the cost. The committee members also guided IIT Rajasthan on how to go further with the testing and further design process.

It turned out that only the functional requirements of the EOI were not enough, and a much detailed and specific software and hardware specifications were needed. These detailed requirements were worked out by IIT Rajasthan after several iterations by way of discussion with industry and internal research, design and testing. In the process the team working at IIT Rajasthan evaluated several similar products and designs already available in the market at time.

After several iterations and research, the much detailed software and hardware requirements were published in a ’Request for Proposal’ (RFP) document to the firm who was chosen to execute the supply of 100,000 devices.

The firm who won the EOI and was given an RFP could not execute the project as it expressed its inability to comply with certain financial commitments laid out in the RFP as per Government of India guidelines of purchase.

Due to the said firm expressing its inability to carry out the project, the EoI/RFP process was scrapped in January 2011, and the MHRD advised IIT Rajasthan to come out with an open tender.

The tender appeared to the public in January 2011, to be closed in April 2011. Following firms participated in the bidding:

(a) Bharat Electronics Ltd., Bangalore
(b) Fitech Equipments India Pvt. Ltd., Mumbai
(c) ST Microelectronics, Noida
(d) EAFT, Bangalore
(e) Datawind Ltd., UK
(f) Moschip, Bangalore

M/S Datawind Ltd. (”the vendor”, hereinafter) won the tender after technical evaluation by a committee of experts from reputed academic institutes.

3. **Detailed Design Documentation of the device prepared by whom and when?**

As mentioned previously, the detailed documentation of software and hardware requirements were prepared by IIT Rajasthan based on the EOI. These specifications were released with the said RFP and later on in the open tender with slight improvements (as mentioned, this RFP was scrapped).

It was the responsibility of the vendor to come up with its own industrial design.

The industrial design for production that includes Gerber files and other design documentation is a process that needs to be carried out by the firm who goes into production. IIT Rajasthan is not aware if the industrial design was done by the firm that could not execute the RFP or some of its subsidiary, or the firm that won the tender (or some of its subsidiary). The timeline of IIT Rajasthan’s providing the detailed specifications is October 2010 to December 2010 to April 2011.

4. **Any copyright, patent or certification of correctness of design was done. If yes, when and by whom?**

IIT Rajasthan chose not to file any patents or copyright claims for the following reasons:

(a) Similar designs were already available in the market, and the concept of a touch-enabled computing device dates back to 1970s and 80s when the first touch-enabled palm-top computers were released by the majors like HP, Palm and Apple.

(b) IIT Rajasthan was only working as an enabler providing intellectual inputs and feedback to the design process, based on its internal research. The main goal assigned to IIT Rajasthan was to test the devices on their functionality and that task could only be carried out once the prototypes were available.

(c) IIT Rajasthan could not ask the vendors participating in the RFP or the tender process to realize IIT's internal designs, as those were based on some specific parts from some specific corporations. Asking the vendors to stick to IIT's own designs was to mean that IIT was favouring some specific chip-set manufacturer and that would have been ethically and procedurally a wrong-doing.

(d) It was specifically mentioned in the RFP, and later in the open tender, that any software that was to be used in the devices must be in open domain.

(e) Specific closed source device drivers are the properties of the specific chip/part provider. For example, if we use an Atheors WiFi controller in some device, the driver for it will be supplied only by Qualcomm Inc. which controls Atheros nowadays. The specifications of such chips generally are not available in open for one to be able to write his/her own software drivers.

(f) Any patent that can be made on such a device can only be specific to the industrial design, and it is also apparent by now why IIT could not ask the vendor to realize IIT's design. Therefore, any claim of patent or copyright, if it exists, can be with the supplier/producer or its affiliates. IIT is not aware of any such patent or copyright claims by the vendor. There is no written communication from the vendor to this effect.

5. **How much money and time spent on conversion of design specs into a prototype model before launch? Who were the individuals and/or institutions involved?**

The open tender process (including the signing of the contract with the vendor who won the tender process) was finished in June 2011. However, since the specs were available as part of the open tender document, the vendors had access to them since January 2011. The first prototypes supplied to IIT Rajasthan were in June 2011. So approximately five months were available to the vendor to complete the specs-to-prototype translation process. However, we cannot pin-point the exact amount of time (and money) required by

the vendor. Any amount of efforts in terms of time and money spent can only be identified by the vendor.

The vendor or its affiliates carried out the translation according to their own technical capabilities and economic considerations. However, IIT Rajasthan and MHRD constantly provided them several inputs on design requirements from the end of the month of February 2011 till the time first set of prototypes were delivered to IIT Rajasthan. During all this time, MHRD actively participated in the process by way of video-conferencing and telephonic conversation. IIT regularly apprised the officials in MHRD of the day-by-day progress of the project.

The initial prototype had several shortcomings related to the functioning of the devices, e.g., the WiFi not working, SD card interface not working etc., and IIT Rajasthan and the faculty members and students of the institutes from the entire country, who were getting trained related to future activities planned for the device – including software development, provided a constant feedback and suggestions, sources of those shortcomings and how to overcome them. The details of the individuals outside IIT Rajasthan can be found in *the report* [Pages 174 to 179].

For the purpose of training the individuals for software development, testing and training, IIT used the project money sanctioned for this purpose in order to set up a facility of 40 desktop computers and associated networking infrastructure and equipment. Additional money was spent to conduct training workshops, in salaries of project staff hired by IIT Rajasthan etc. A detailed breakup of all the expenditure is produced in *the report* [Pages 18].

If the committee seeks the breakup of the funds in some other format, we'll be prompt in providing the same.

6. **On what basis we can claim it to be an Indian design product?**

Since IIT did not supply any industrial design and only helped in rectifying the shortcomings and provided detailed specifications for 'Aakash – The Low Cost Access Device', we cannot claim it to be an Indian design. The vendor who were to supply the product has the last word on it.

However, since one part of the project was to improve the specifications and coming up with better design, IIT kept working towards that goal. Receiving the instructions from Honourable HRM on November 14, 2011, IIT coordinated with India Semiconductor Association (ISA) in late November to come up with devices that improved upon the

shortcomings in the first version that was released on October 05, 2011 by Honourable HRM.

IIT, along with a renowned chip company and a production house, has produced an indigenous design. IIT also participated in laying out specifications of Aakash - 2. Please note that this new design was based on a completely new chip-set, and was carried out completely from scratch based on the inputs from the chip manufacturer. Also note that the components, since they are not manufactured in India, are to be imported for the new design.

Also note that, IIT released a second tender in January 2012 as per the specifications of the so called 'Aakash - 2' in order to realize the vision of the project and the mission. Technical evaluation of submitted bids involved functional testing by IIT, followed by a physical testing procedure as per the same testing protocol supplied to M/S Datawind earlier. This physical testing was performed by the world-renowned testing agency, UL Inc. (http://www.ul.com/india/eng/pages/).

After the complete technical evaluation, IIT was to open financial bids from the participating (successful in technical evaluation) firms. But that process could not be completed, as IIT was instructed not to spend the money from the project expecting the transfer of the project.

Please refer to *the report* [Pages 16-17] for the details of the process related to'Aakash-2' and related communication that ensued in November-December 2011.

7. **EOI released for possible procurement of one lakh access devices and the information provided by IIT Rajasthan or by others?**

EOI is attached herewith as ANNEX - 1.

Most of the information provided by IIT Rajasthan towards this EOI has already been mentioned. Also, it was done in consultation with MHRD.

The detailed specifications in order to fulfill the functional requirements of the EOI was IIT Rajasthan's research, along with the feedback from industry.

8. **Verification, design and performance check of prototype model before formal release of bulk orders by whom and when?**

a) The open tender released had a clause on submitting a few prototypes at the time of submission of the bids. Those prototypes were evaluated by an independent technical

review committee. Only the vendors who submitted functioning devices could have their financial bids opened.

b) The successful bidder (the vendor) was asked to submit a working prototype of the exact requirements laid out in the open tender. The vendor was allowed to go into bulk production, only if the prototypes worked satisfactorily.

c) The check points for the performance and functionality of the device prototypes were laid out by IIT Rajasthan, in consultation with MHRD.

d) The timeline for this exercise ranges from February 2011 to July 2011.

9. **Performance verification of devices by IIT Rajasthan against what spec and by what standards?**

(a) Performance verification and functional testing was carried out by IIT Rajasthan on a mutually agreed (between IIT and the vendor) testing protocol. The documents to this effect are part of *the report* [Page 193]. The corresponding test reports are also attached. These test reports have been signed by IIT officials and the officials of the Vendor (as high as the Vice President (VP) of the vendor company).

(b) Later on, in December 2011, the vendor, upon failing tests on all the supplied batches, contested against the test reports signed by its VP. Upon specific request, in a meeting held at Shastri Bhawan (November 15, 2011), a detailed standardized test protocol, and then a revised test protocol vetted by Indian industry, was given to the vendor. The latest protocol was, mostly, accepted by the VP of the company, but rejected by its CEO, saying that it adhered to militarized standards.

(f) All test protocols adhered to the same hardware and software specification mentioned in the open tender.

10. **Status of development of test facility at IIT Rajasthan? What are the components of test facility to be setup as per the project proposal and their status?**

IIT was moving as per the detailed planning towards completion of in-house testing laboratories. To this regard, two representatives IIT presented the progress till October 14, 2011 to the Standing Committee of NMEICT in a presentation made on October 15, 2011, wherein the Standing Committee gave valuable feedback on how to proceed further.

According to the advice of the members of the SC towards the development of the testing lab (initial specifications), IIT sought input from the industry. The participating industries in this exercise were

(a) National Instruments
(b) HCL Technologies
(c) Freescale Semiconductors
(d) Infosys Technologies

These companies provided their suggestions in email communication. The communication has been detailed in the ANNEXE 12 [Pages 211 to 239] of *the report*. IIT incorporated the industry recommendations and feedback for the equipment specification and space requirements in its plans to establish the testing facility.

The institute could not proceed to establish the testing facilities because of circumstances beyond its control, as detailed following.

• **Land acquisition for the permanent IIT campus:** The land for the permanent campus was allocated to IIT Rajasthan in March 2011. Around the same time, MHRD sanctioned the whole amount required to complete the project, including the establishment of the testing laboratory. This laboratory requirements included several test-chambers that are very difficult to move around. So a conscious decision was made to establish the laboratory at the permanent location.

But at the permanent location allotted to IIT, the local farmers from whom the land was acquired by the Rajasthan State government started agitating against acquisition immediately after the acquisition process was completed by the State. Since May 2011, the agitation was in the form of Dharana at site and stoppage of construction work of electric substation and boundary walls, including the incidents of vandalism and damage to certain installations like weather station etc.

In view of this situation, it was considered prudent not to proceed with the tendering process towards the procurement of the equipment, it being a turn-key project for which site preparation was to be given to the successful bidder if the tenders had been released.

Despite serious efforts on part of IIT Rajasthan and the governing bodies at different levels, the matter took a long time to get resolved only after it was decided by the MHRD to transfer the project and funds required to IIT Bombay.

• Please note that IIT had done all the due diligence, including drafting the tender and finalizing specifications, the design of the laboratories and site plan, but since the

specifications for the test-and-measurement equipment change with time, it was advised that the procurement exercise should only have been done once complications
at the new site for the permanent campus were sorted out.

11. **Basis of rejection of the supplied access device supplied by the vendor.**

The devices were rejected since the failure rate of the devices was much beyond the industry standard, and the rate mentioned in the contract. The rejection parameters were mutually agreed, and email communication to that regard is part of the said report. Please note that, the vendor company's VP himself observed one of the testing sessions and signed the testing report. In all the batches that were supplied by the vendor, the device failure rate was never less than 22%. According to the agreement, if the failure rate on a sample test were more than 5% in a batch, the entire batch had to be rejected.

Moreover, the feedback received from all parts of the country reporting the non-performance of device. On October 05, 2011, as it is widely known, Honourable HRM unveiled the device for further field testing by the students in higher education. On this occasion, a total of 394 devices were distributed among students belonging to 20 colleges (other than IIT Rajasthan students) spanning 09 states, asking them to submit their feedback report within 45 days. The majority of the feedback from 234 students ranged from inadequate to poor. The summary of the feedback is part of *the report* [Pages 180 to 185].

ANNEX - 1

EXPRESSION OF INTEREST

Government of India, Ministry of Human Resource Development has declared its intention to develop a Low-Cost Access Device at a cost of $35 (Rs. 1500) or below for Institutions of higher learning. The specifications and minimum functionalities of such devices are available in the public domain in the Invitation to Innovate published by MHRD. The Invitation to Innovate is also posted on the websites <http://www.sakshat.ac.in/> and <http://www.education.nic.in/>. The specifications and minimum functionality of the desired devices are copied below:

MINIMUM FUNCTIONALITIES

Support for video web Conferencing facility / Multimedia content viewer for example .pdf, docx, .ods, .adp, .doc, .xls, .jpeg, .gif, .png, .bmp, .odt, .zip, AVI, AC3 etc. / Searchable PDF reader / Unzip tool for unzipping zip files / Possibility of installing suitable firmware upgradation / Computing capabilities such as Open Office , SciLab , cups (for printing support) / Media player capable of playing streamed as well as stored media files / Internet browsing, JavaScript, pdf plug-in java / Wireless communication for Audio/video I/O / Cloud computing option / Remote device management capability, Rendering YouTube and other online video services (open source flash players, e.g., gnash or swfdec). Other Preferable:

- Playback: AVCHD
- Multimedia I/O Interfaces: DTV, IPTv, DTH
- Internet browsing: flash player (adobe)

SPECIFICATIONS

Suitable motherboard/ System on Chip to provide the above mentioned functionalities / Qwerty keyboard, mouse and a minimum display of 7” colour LCD/TFT (Touch screen optional) or suitable All-inone projection system / Minimum of 2 USB 2.0 ports and USB hosts / RF, Certification- all “CE Certificate” (FCC Guidelines) / Three hours or more uninterrupted operation through Battery or Batteryless device / Battery charger with Adapter or Hybrid super Capacitor quick charger / SD card slot (with support for minimum of 8GB) / RGB / Support for Connecting LCD projector/ Support for external hard disk drive (minimum 32 GB) / Suitable Ethernet port / WLAN card (IEEE 802.11 a, b , g, n) desirable / Alternative Battery support through solar cell, or Hybrid Capacitor will be desirable / Web cam (embedded webcam desirable) / Adequate RAM and Hard disk drive or NAND flash may be provided so as to meet the desired functionalities / Shock resistant casing of suitable form factor for the device, environmental Shield desirable/ Operating temperature Zero Degree centigrade to 48 Degree centigrade. Max humidity 80% shock resist = 2g / ROHS Compliant Other Preferable:

- HDMI port

Expressions of Interest for design, production of such devices with the same or added functionality at a cost of $35 or lower than that, is invited. Expressions of Interest may be submitted by registered firms who are manufacturers or companies with a capability of design, sourcing, manufacture and delivery of the Low-Cost Access Device. EoIs can also be submitted by a consortium, but at least the lead member of the consortium will have to meet the qualification criteria given above. All EoIs submitted must provide documentary proof of capability and in case of a consortium, the consortium agreement duly signed by all members must also be submitted along with the EoI. All Expressions of Interest submitted must include the proposed solution along with time-lines, clearly detailing the road-map for cost reduction (below $35) and improvement of functionality. The proposed steps which would be taken to ensure quality, timely delivery and maintenance of the devices are to be included in the EoI. The Participants are required to supply 100 pieces of their device for Quality Assurance before they are shortlisted to participate in the project of delivering 1,00,000 Tablets/Laptops/Access-Devices by January 2011. It is expected that successful field trial of 1,00,000 pieces, the requirement may further grow to ten (10) million pieces within a short span of one year.

Expressions of Interest meeting the above criteria and guidelines must be submitted at the following address:

The Director,
Indian Institute of Technology Rajasthan
Near Computer Science & Engineering Department
MBM Engineering College, Jodhpur – 342 011.
Rajasthan, India.
Email ID: drpremkalra@gmail.com
Telephone: 0291 – 2512141

The last date for submission of Expression of Interest is 4 weeks from the date of publication.