

National Strategy & Action Plan for ICT in Education



1. Introduction:

The first question that needs to be asked is whether we are ready to create or exploit a knowledge-based economy. One of the major reasons for introducing e - learning is to better prepare for a knowledge-based economy. E - Learning is like helping children learn to swim, by letting them play in the water. It is the right environment for learning how to operate in a knowledge-based society, not just for work but also for life. Those countries that are not yet ready for the knowledge-based economy are probably not yet ready for e - learning.

One major issue is the balance between investment in e – learning, compared with investment in either traditional campus-based education, or in the more traditional print - and – broadcasting – based Open University. Studies have shown that the print – and – broadcasting – based Open Universities offer considerable cost and sometimes quality advantages over conventional campus-based education, due to the economies of scale of the Open Universities. These cost advantages over traditional campus-based education are not so apparent with high quality e - learning. The big difference between e – learning and open universities is the direct interaction between the instructor and the students in e – learning, leading to more individualized instruction. This encourages critical thinking skills, good communication skills, problem-solving skills, the ability to work in a team and eventually the ability to take responsibility for learning and personal action, all the skills needed in a knowledge-based economy.

This, however, comes at cost. Although there are some economies of scale compared with traditional campus-based education, e – learning requires a reasonable students/teacher ratio to avoid instructors becoming swamped with e-mail and discussion forum messages. What e – learning is offering is a more interactive education encouraging critical thinking, communication skills, and flexibility for both students and teachers, compared with the one-way mass media of open universities. For countries that have reasonable Internet infrastructure, e – learning will provide advantages over both traditional campus-based education and open universities.

Globally the importance of using ICTs in education, more specifically e – Learning, has been well recognised. It has been clearly understood that ICTs has potential to

add more value and provide effective learning **for all, anywhere and anytime** with real-time interactivity, which as such is not possible through the conventional face-to-face classroom learning. Therefore, the children from nations who do not adopt ICTs in educations, will be left behind and result into serious knowledge-divide.

In the backdrop of above background, USA, several members of European Union, Australia, British Columbia, Africa etc. have developed elaborate programmes for deployment of ICTs in education. In fact 21st century means more than basic reading, writing and computing skills in the context of modern life.

“The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn” – Alvin Toffler.

India today, is seen as the fastest growing economy and with its prowess in Information Technology has positioned itself as the most preferred outsourcing destination. However, if India has to sustain this growth and retain its competitive position, the educational demands of the 21st century need to be addressed with utmost seriousness. Therefore, India cannot afford to lag behind but must have a road map for deriving the benefits of the potential ICTs have for providing education.

2. National goals for ICT in education:

In the light of the relevance and importance of adopting information and communications technology in the education sector, the National Strategy & Action Plan for Information & Communication Technology in Education shall have following FIVE goals:

Educational Goals

Goal 1:

All students and teachers will have access to information and communication technology in their classrooms, schools, communities and homes.

Goal 2:

All teachers will use technology effectively to help students achieve high academic standards.

Goal 3:	All students will have technology and information literacy skills.
Goal 4:	Research and evaluation will improve the next generation technology applications for teaching and learning.
Goal 5:	Digital content and networked applications will transform teaching and learning.

3. National Strategy & Action Plan for India:

3.1 ICT in School Education in India is Inevitable

The above educational goals of using ICTs in school education are very ambitious but at this stage of the 21st century we need to be fully convinced that in no way nations can afford to miss the ICT revolution. It is perhaps the first and the last opportunity in the history of mankind that a technology of potential to enable education for **all, anywhere and anytime, has become a reality. The phenomenon of converging the world into a global village is something that has brought-in a paradigm shift in the way future economies will develop. It is this very feature of ICTs that requires nations to adopt ICTs in the day-to-day lives of their people. The sooner it is done, better it would be for countries to become part of the Global Information Society. There is no time to think, wait and experiment. Rather it is the time for action.**

It has been explicitly established in the preceding chapters of this report that if India has to maintain sustained economic growth and retain its position as prominent destination for Knowledge Processing Outsourcing (KPO), it is in our interest to focus on using ICTs in the education sector, especially at the elementary and secondary levels. There is no time to wait and think. It is inevitable and should have been done yesterday.

In the backdrop of above, following actions are recommended for the consideration of the Government of India:

3.2 Partnership @ Developing Ignited Minds for 21st Century (PARADIGM 21)

In these crucial times of the 21st century, developing effective partnerships for ICT in schools is the most pragmatic and practical way to popularize ICT in education or more specifically exploit the killer application of ICT for e-learning. There are several success stories around the globe that have established and proved this concept. In the times of resource crunches and the day by day widening digital divide, it is utmost necessary to leverage all national resources and adopt ICT in education through out the country without loss of any further time.

Among others, the Rajasthan Education Initiative (REI) in partnership with several leading ICT business organisations including World Economic Forum and Global eSchools & Communities Initiative is seen as one of the pragmatic strategies to proliferate ICT in education and save the future generations from the growing digital/ knowledge divide. This initiative could however, be reviewed in details to learn from the experiences gained in its implementation.

It is therefore suggested to devise a scheme titled **“Partnership @ Developing Ignited Minds for the 21st Century (PARADIGM 21)”** in order to implement most of the activities. The structure of the scheme, its objectives, scope & implementation mechanism shall be as given below:

3.2.1 Objectives of PARADIGM 21:

The broader objective of the initiative is to supplement government efforts in achieving the National objective of Education for All (EFA) or the Sarva Shiksha Abhiyan (SSA), which will have significant effect on increasing the competitiveness of India by creating a talented and skilled workforce for the future, through the use of ICT in school education.

However, specific objectives of the initiatives could be -

- To evolve innovative and locally appropriate models of PPPs, with a high potential of being scaled up, to improve educational outcomes.

(Suggestions submitted in personal capacity)

- To adopt and adapt best practices from both the public and private sector while ensuring community participation.
- To deploy new technologies, particularly ICTs, to modernize educational service delivery, skill development and quality learning.
- To create systems to enable greater community participation in the state's educational programme.
- To enhance the flow of resources into the educational sector by structuring suitable projects and creating incentives for increased participation of different stakeholders.
- To focus efforts on serving underprivileged communities in urban and rural areas as well as on girls and children with special needs.
- To demonstrate the success of such public-private partnership interventions by evaluating the impact on students.
- Setting up IT infrastructure, content and capacity building
- Teacher and student training to expose teachers to computer technologies and training on hardware and computer troubleshooting courses
- Emphasis on universalization of quality elementary education

3.2.2 Partnership stakeholders in PARADIGM 21 Scheme

Initially following stakeholders are proposed to be the members of the partnership. Membership can be enhanced at any point of time depending upon the need.

- ⇒ Government of India
- ⇒ Global e-Schools and Community Initiatives (GeSCI)
- ⇒ National Association of Software & Service Companies (NASSCOM)
- ⇒ Confederation of Indian Industry (CII)

(Suggestions submitted in personal capacity)

- ⇒ National Council for Educational Research and Training (NCERT)
- ⇒ National Council for Teachers Education (NCTE)
- ⇒ Respective State Governments
- ⇒ Industry leaders like (TCS, Wipro, Infosys, Satyam, Microsoft, Intel, Cisco, and IBM etc.
- ⇒ Representative NGOs like Azim Premji Foundation, Hole in the Wall (NIIT) etc.

3.2.3 Scope of the PARADIGM 21 Schemes

3.2.3.1 Professional Services

This scope of the scheme is to focus ICT in school education in a holistic manner and provide full complement of services as single window mechanism such as overall support, consultancy including development of proposals & subsequent implementation, initial feasibility, planning & implementation, teachers training, lifelong learning, development of digital educational content for teachers training and teaching the students.

3.2.3.2 Financial Support

Financial support will also be extended for various activities related to ICT in school education. Some of the activities that should be extended financial support under the scheme could include –

- Setting up of ICT infrastructure **by DOE ACC or STPI** including computer lab (limited to maximum of 25 PCs), access to Broadband Internet, National Digital Libraries & any other such source of educational content, necessary software, development & digital educational content for students & teachers, other auxiliary equipment and operation and maintenance support
- Setting up of ICT infrastructure **by other government / private organisations** including computer lab (limited to maximum of 25 PCs), access to Broadband Internet, National Digital Libraries & any other such

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source of educational content, necessary software, development & digital educational content for students & teachers, other auxiliary equipment and operation and maintenance support

- Development of digital educational content for teachers and students
- Any other activities that may be essential for providing ICT in school education

3.2.3.3 Implementation of PARADIGM 21 Scheme

In order to ensure successful implementation of the initiative, it is desirable to have dedicated and professional agency, which will play the lead role for meeting the objectives as has been shown by the success of the STP scheme.

Therefore, DOE ACC and STPI be designated the Implementing Agencies for PARADIGM 21. They have country wide presence through their centers.

DOE ACC and STPI will extend full complement of services, but not limited to such as those given below:

- Initial feasibility study including logistics, availability of broadband Internet, design and cost implications and necessary financial arrangements
- Completion of all formalities related to any kind of approvals needed including availing financial support under the PARADIGM 21 scheme and/or any other schemes.
- Procurement of equipment and Broadband Internet installation and operationalization of the facility
- Development of the educational content for use by students and teachers
- Initial handholding services including familiarization for using the network for accessing any information etc.
- Operation and maintenance support on pooling basis for reasonable number of schools
- Impact assessment

3.2.3.4 Management of PARADIGM 21 scheme

Management of the scheme would be through an Empowered Committee with professional composition.

3.2.3.5 Corpus Fund for PARADIGM 21 scheme

On the basis of detailed estimations given in **Annexure – I**, initial corpus fund of nearly **Rs. 32,500 Crores (US\$ 7.00 Billion)** is required including the operations for the first three years.

3.2.4 Specific Actions Proposed under PARADIGM 21

3.2.4.1 Review of Existing Curriculum

While it is expected that the Empowered Committee would provide mentoring and specific guidance on deriving maximum benefits from the partnership, some of the crucial steps that should be immediately taken and being proposed under this action plan:

Set up a Government, Academia and Industry Focus Group to review the existing course curriculum to find out the gap areas for the ICT Core-Technical-Profile of an ICT professional needed in the 21st century and recommend introduction / upgradation of courses that should be taken up at the school level itself (Middle and Secondary) as well introduction / upgradation of courses at the degree level.

(It is adequately explained in the report that school level is the stage, which lays the foundation for knowledge development, and the children learn the maximum during this period).

Refer “ The Key Elements of 21st century Learning” detailed in the **Annexure - II**.

It may be considered whether action for such initiative is to be taken by Ministry of Human Resource Development. If so, Department of Information Technology could make a strong recommendation for carrying out review of the existing courses/ curriculum.

3.4.2.2 Development of Technology Savvy Teachers

Promote partnership among State Education Departments, National Council for Teacher Education (NCTE), Industry and the Teachers Training Institutes for undertaking following activities:

3.4.2.2.1 Development of relevant educational digital content for training and lifelong learning by Pre-Service & In-Service Teachers

There is widespread need to impart excitement and relevance to the teaching - learning process so that the young men & women can contribute to, as well as benefit from, the socio-economic progress. Realization of this vision requires the teaching-learning process to shift its emphasis from rote learning to skill development. Since a teacher is the pivot of the educational system, the revitalization process should begin with in-service & pre-service teachers by equipping them with such skills as are needed for effective teaching. Rapid proliferation of ICT needs to be exploited for assisting a teacher to assimilate the art, science & technology of igniting young minds. Simultaneously, creative teachers have to be recognised with morale-boosting rewards & awards so that they become a role model.

The initiative should focus on design of multi-media modules, borderless training strategy and provide pre-service and in-service ICT training for teachers with the help of ICT-based resource packages designed by teachers for teachers under professional guidance and supervision. The focus of such training program should be to provide hands-on ICT learning opportunity for teachers to become more comfortable with technology, incorporating the Internet, Web-page design and project-based approaches to support training.

A possibility of partnership with Intel for its [Intel@Teach](#) programme should be explored. Under this programme, Intel can provide training programmes capable of increasing the technology skills of the teachers and students as well as can help teachers integrate technology into the regular curriculum and enhance students learning capacity in the classroom. This initiative of Intel has been very successful in Brazil where they could train 170,00 teachers and 2.5 million students by 2006.

(Suggestions submitted in personal capacity)

Specifically, the teachers training modules must focus on the following to develop competent teachers:

- ⇒ Demonstrate a sound understanding of technology operations and concepts.
- ⇒ Plan and design effective learning environments and experiences supported by technology.
- ⇒ Implement curriculum plans that include methods and strategies for applying technology to maximise student learning,
- ⇒ Apply technology to facilitate a variety of effective assessment and evaluation strategies.
- ⇒ Use technology to enhance their productivity and professional practice.
- ⇒ Demonstrate an understanding of the social, ethical, legal and human issues surrounding the use of technology in education.
- ⇒ Improve the preparation of new teachers, including their knowledge of how to use technology for effective teaching and learning.

3.4.2.2 Improve real-time instructional support available to teachers who use technology:

High-quality, comprehensive instructional support is critical in assisting teachers to integrate technology into their instruction. Such support may include the availability of just in time (JIT) individualized training and professional development activities, with content that focuses on supporting teachers to integrate the technology available to them into their instruction. Technology coordinators also play a critical role in fostering the effective use of technology in schools through their knowledge of both technical and instructional issues. Strategies include:

- States, districts and content associations and organisations, and private sector organisations should develop online resources to provide just-in-time support to teachers. Specific examples include education-focused portal sites for teachers, which offer online communities for professional development or mentoring, tools

for classroom management and administrative tasks, and tools to facilitate increased communication with parents and community members,

- Educational technology organisations should consider developing national standards and certification programmes for technology support professionals and programs,
- Districts and schools should develop comprehensive technology support programs, directed by qualified technology coordinators at each school building, and
- States, districts and schools should investigate emerging approaches to providing technical and instructional support over the Internet by building, using, or purchasing teacher-specific resources online.

3.4.2.2.3 Competitions to reward Teachers with high ICT Skills

One of the ways to motivate teachers to acquire ICT skills is to introduce competitions like Global Junior Challenge (GJC) & the Stockholm Challenge Award (SCA) competitions:

Such competitions will inculcate habits of continuous knowledge upgradation or in other words adopting lifelong learning.

3.4.2.2.4 Introduce ICT Proficiency in Certification & Selection of Teachers

Proficiency in ICT applications should be considered as one of the important criteria for teacher's qualification and their selection. Therefore, necessary steps may be taken at the Central and State levels to notify such regime and ensure introduction of relevant courses by the teachers training institutes.

- ▶ Facilitate liberal and easy loan facility for purchase of Broadband Internet and PC by teachers and students in collaboration of Banks etc.

- ▶ Facilitate concessional broadband connection and PC to the teachers and students in collaboration with industry.
- ▶ Provide income tax exemption on amounts spent on Internet connection and purchase of PC to students and teachers.

3.4.2.3 Providing Access to ICTs in Schools

3.4.2.3.1 Importance and Relevance

As adequately explained earlier under point 10.3.1 “Case for India”, E-Learning is one of the cutting edge killer applications of the Information and Communications Technology (ICT). Globally, the importance of using ICTs in education or more specifically for E – Learning, has been well recognised. It has been clearly understood that ICTs have potential to add more value and provide effective learning **for all, anywhere and anytime** with real-time interactivity, which as such is not possible through the conventional face-to-face classroom learning. Therefore, the children from nations who do not adopt ICTs in educations will be left behind and would suffer from the phenomenon of increasing knowledge-divide.

As a result countries like, USA, European Union, Australia, British Columbia, Africa etc. have developed elaborate programmes for deployment of ICTs in education. In fact 21st century means more than basic reading, writing and computing skills in the context of modern life.

India today, is seen as the fastest growing economy and with its prowess in Information and Communications Technology has positioned itself as the most preferred outsourcing destination. However, if India has to sustain this growth and retain its competitive position, the educational demands of the 21st century need to be addressed with utmost seriousness. Therefore, India cannot afford to lag behind but must have a road map for deriving the benefits of the potential ICTs have for providing education.

It has further been argued in various studies that school age is the right period during which the children have capacity to learn and master new things fast and therefore, suggestions have been made to start teaching some of the essential elements of the 21st century education at the school level itself. EU and US for

(Suggestions submitted in personal capacity)

example, are working very seriously towards achieving this goal under the programmes of 'Making EU a Leading Knowledge Society by 2010' and "No Child Left Behind' respectively.

In a recent report published in Hindustan Times (Issue dated 27.7.2007) it has been indicated that a survey of 11,24,033 elementary educational schools in all the 35 States in the country, conducted by National University of Educational Planning & Administration, has revealed that about 90,000 of these schools do not have even the blackboards and out of them 21,699 schools (without blackboards) are also without teachers. With such a poor state of affairs in the school education in India, it is not only important but a critical need that we exploit the ICTs to offer alternative means for education.

It is therefore suggested that Government may consider providing **at its own cost** PCs and broadband Internet connectivity initially to all the **government-aided schools** in the country. List of the schools is given in Annexure – III.

3.4.2.3.2 Financial Implications of Providing ICTs to Schools

There were about 11.95 lakh government recognized schools in the country upto March 2005 as per the details given in Annexure – III. These schools have been estimated to be approximately 13.70 lakh as on March 2007 on the basis of 8-10% growth per years and the same are summarized below in Table.

S. NO.	SCHOOL CATEGORY	AS ON 2004-2005	CURRENT (ESTIMATED)	GOVERNMENT AIDED EES: 85% SES: 55%
1.	Elementary Educational Schools (EES)	10.43 lakh (*)	12.00 lakh	10.20 lakh
	(a) Primary/ Junior Basic Schools	07.68 lakh	09.00 lakh	7.65 lakh
	(b) Middle/ Senior Basic Schools	02.75 lakh	03.00 lakh	2.55 lakh
2.	Secondary Educational Schools (SES)	01.52 lakh	1.70 lakh	1.00 lakh
3.	Total Schools – (1+2)	11.95 lakh	13.70 lakh	11.20 lakh
4	Total Elementary (Middle) & Secondary Schools	04.27 lakh	4.70 lakh	3.55 lakh

(*) - Number of Elementary schools grew to 11.24 lakh by 2005-2006. Therefore, based on same trend number of elementary schools by 2006-2007 is estimated as 12.10 lakh

Detailed estimates for the funds required are given in **Annexure – I**.

As per the above details, it is estimated that following corpus fund would be needed for meeting the **CAPITAL COST & 3 YEARS RECURRING COSTS** FOR providing access to ICTs in government recognized & aided schools in the country:

- ▶ **Secondary Schools alone: Rs. 7300 Crores (US\$ 2.16 billion)**
- ▶ **Elementary (Middle Schools) alone: Rs. 18.615 Crores (US\$ 5.45 billion)**
- ▶ **Secondary & Elementary (Middle Schools): Rs. 25,915 Crores (US\$ 7.60 billion)**

3.4.2.3.3 Broadband Internet Access

Broadband Internet access is probably the most important components for deployment of ICT in education due to the multimedia (audio, video & text) educational content handling requirement.

Following options shall be explored for providing broadband Internet access to schools:

- ✘ **Connectivity by ERNET/ Vidya Vahini**
- ✘ **Connectivity by NICNET**
- ✘ Need for expansion of Vidya Vahini/ ERNET/ NICNET
- ✘ **Connectivity by Internet Service Providers considering also their plans in the near future**
- ✘ **Connectivity from the e-Governance Common Service Centers (CSCs)**
- ✘ **Pilot WiMAX local connectivity:** If there were no other alternatives available to provide Internet connectivity in certain areas, it would be worthwhile to take advantage of this scenario and carry out the feasibility for

establishing pilot WiMAX connectivity to schools. Among various technological options today, WiMAX is the latest state-of-art wireless technology that provides high speed Internet access. Its unique feature is that it does not require Line-of-Sight (LOS) and can operate in side buildings, which enables computers with WiMAX port to be located anywhere within the building premises.

Under its 'World Ahead Program', partnering with public and private organizations, Intel is driving WiMAX broadband development that will reach cities as well suburban and rural communities that initially were either impossible or too costly for carriers to pursue. Intel target is to connect another billion children and adults to the Internet and to the rest of the world.

Therefore, in order to prove the concept and showcase its success, pilot to establish WiMAX connected schools in some identified rural areas, could be initiated as a full e-Learning center, including hardware, software, high speed Internet and teachers training; in partnership with Intel.

Depending upon its success, the above concept could be expanded to other schools providing PCs and servers in the computer labs, libraries and administrative offices of the schools and thus develop a School – Network.

3.4.2.3.4 Access to Computing Resources & Educational Content to Schools

Availability of reasonable number of computers in a school is a vital requirement. Ideally the efforts should be to ensure Computer – Student ratio of maximum 3 but financial constrains may make it difficult to equip all schools with such infrastructure in one go. Therefore, to start with, our objective should be provide a Computer Lab in each of the schools with a capacity of 10 – 20 computers and associated Local Area Network, software and the educational content. In addition the computer lab will have access to global Internet, National Digital Libraries & to other such content resources.

3.4.2.3.5 Include e-Learning as a component of National e-Governance Plan (NeGP)

E Learning, world over is considered as one of the important components of the delivery of e-Governance services. In India the National e-Governance Action Plan (NeGAP) is under implementation. Under the NeGAP, about 100,000 Common Service centers (CSCs) to cover all the 600,000 villages in the country, are being set up for enabling citizens to access e-governance services.

It is an opportunity for India, **not to be misses at all**, that e Learning is integrated into NeGAP for accelerating deployment of ICTs in school education by exploring the following possibilities:

- ❖ Consider locating the CSCs in a school premises or somewhere adjacent to the school and provide Internet access to school for eLearning as shown in the diagram below
- ❖ Bundle eLearning as one of the e-Governance services delivery for making it as a Public-Private-Partnership initiative.
- ❖ Carry out feasibility of using CSCs as the base station & provide WiMAX connectivity to the near by schools.

3.4.2.3.6 Utilization of the Universal Service Obligation (USO) Fund for Financing PCs and Broadband to Schools

Department of Telecommunications, Government has accumulated huge amount in its USO Fund – Rs. 7200 Crores at the end of 2005-2006.

The USO Fund is ear marked for government interventions for providing Telecom infrastructure and services in areas, which as such are not found to be cost effective, by the authorized Telecom service Providers. However, there is a definite case to utilize USO Fund for such ICT applications as well, which would give a fillip to the growth of Telecom Services. For example, if the USO Fund is utilized to fund the supply of PCs and Broadband Internet services to the government aided schools, it would indirectly have significant impact on increasing the demand for Broadband

services. The cascaded effect would be in lowering the costs of the equipments as well as for the Broadband access.

Under this scheme the arrangement could be worked out with the Broadband Service Providers to supply the PCs and the Broadband connectivity as a **bundled package** of service so that the USO Fund as such flows to the Telecom service providers only.

It is therefore suggested that government may seriously consider utilization of USO Fund for providing PCs and Broadband Internet connectivity to all the government aided secondary schools in the country as proposed above. It is a win-win situation both for the Government and the Telecom Service Providers.

3.4.2.4 Pilot SchoolNET for a State Education Board

It is suggested that under the PARADIGM 21 scheme, we may consider establishment of a pilot SchoolNET for one State Education Board, say for example in the State of Himachal Pradesh, which has difficult and hilly terrains and as a result investment by the private sector for various ICT services in this area is a difficult proposal.

If successful (which it would be – no reason for failure), It will become an easily replicable model through the country.

Detailed plan for such SchoolNET for a State could be developed once the concept is agreed to.

3.4.2.5 Introduction of a special schemes for purchase of PCs & subscribing broadband Internet connectivity by individuals & schools

Broadband connectivity is very much required for e-learning applications due to the educational content being multimedia. However, due to financial constraints with schools, teachers and students they are not able to take advantage of the ICT revolution, even if they are seriously interested. Therefore, special schemes are needed to facilitate purchase of PCs and hiring Broadband Internet connectivity by

students and teachers at their homes. It will encourage several students and teachers in the country to become ICT savvy.

In order to realize the above dream, it is suggested that government may consider following schemes:

- ▶ Provide free broadband connection with PCs (Minimum 10 per school) to all government schools (3.25 lakh in the country).
- ▶ Facilitate liberal and easy loan facility for purchase of broadband Internet and PC by Teachers, Students and the Schools.
- ▶ Facilitate concessional broadband connection and PC by Teachers, Students and Schools in consultation with industry.
- ▶ Provide income tax exemption on the expenditure incurred on Internet connectivity and purchase of PCs.

3.4.2.6 Life-Long-Learning (L3) / Finishing Schools

As explained elsewhere in the report, the ICT professionals in the 21st century would need academic education in core subjects as well as in other areas like soft skills, economics, civics, geography etc.

The normal upgradation of the course material of core subjects may take place over the period but in order to meet the immediate requirements, government may encourage setting up of Finishing Schools for providing such additional exposure and hands on experience to those students who acquire certain level of educational qualifications from schools/colleges/universities and make them readily employable.

The finishing schools are required in various categories to meet the requirement of a varied cross-section of the community such as –

- ▶ **Personality Development and Corporate Grooming** for fresh degree holders including information communications skills, thinking & problem solving, inter-personal and self-directional skills (Inter-personal and

(Suggestions submitted in personal capacity)

Collaborative Skills, Self-Direction skills, Accountability and Adaptability skills, social responsibility

- ▶ **Special programs for teaching 21st century learning content such as Global Awareness, Financial, Economic and Business Literacy and Civic Literacy.**
- ▶ **Soft-skills Development** such as Emotional Awareness, Stress Management, Anger Management, Time Management, Leadership skills, Team building, Relationship Management, Life Style Management etc.
- ▶ Trade specific courses for ITI certificate or Diploma holders whether employed or un-employed such as welding techniques, machine operations, textile designing, electricians, fitters,
- ▶ Special expertise/ high skills development courses for those in job but need skills to be enhanced
- ▶ Skill development program for Pre- Service and In- Service teachers in areas like ICT applications, World Wide Web, Search and analysis of information, educational resources, change management etc.
- ▶ Program focused on life-long learning like new technological development, ICT applications, Best Practices in important business areas and all such areas one should possess the relevant knowledge.

In order to make this concept attractive for investment to take place, government may consider certain incentives to those investing in such ventures. The incentives could include –

- ▶ Free/ concessional - land allotment
- ▶ Full exemption for payment of income tax on the earnings
- ▶ Support in recognition/ certification of the courses by the industry and government system as may be required

DOE ACC is directly involved in promoting ICT related vocational education. On the other hand, STPI, which has been set up to promote IT software and services exports from the country by implementing the Software Technology Parks (STPs) scheme of the Government of India, also has capacity development for the IT software & services sector, as one its important objectives. However, nothing noticeable had been done by STPI even after over fifteen years of its existence. However, given the strengths and the credibility it has established, it would be ideal for STPI to focus on capacity building to meet the needs of the 21st century. Therefore, STPI could consider setting up Finishing Schools at its major centers as early as possible.

It would also help STPI in its sustainability otherwise, after the implementation of Information Technology Act, (ITA) of WTO, stiff competition in the telecom sector etc. the STP scheme is loosing grounds day by day.

3.4.2.7 Support Related Research & Development

Government may fund the research and development activities pertaining to ICT in education. Specifically it could include -

- ▶ Development of low cost affordable computers and networking equipment
- ▶ Development of content for various disciplines
- ▶ Development of management systems – learning management, content management, school management etc., especially those based on Free Open Source (FOSS) developments
- ▶ Development of new student assessment tools - Emerging research suggests that traditional paper-and-pencil assessments may no longer accurately capture the learning of 21st century students. In addition, through innovative private- and public –sector collaborations, technology itself will offer opportunities to improve the assessment of students. Other opportunities to increase our understanding of student assessment include participating in international comparative work currently underway. These cross-national studies, led by the organisations like International Association for Evaluation of Educational Achievements (IEA) and Organisation for Economic

Cooperation and development (OECD), provide unprecedented opportunities to learn from the experiences of other countries that are also engaged in efforts to improve student assessment.

- ▶ Development of content in local languages – ‘Localized Content Initiative’. While doing so, we may also consider expediting the National Digital Libraries initiative.

DIT may consider continuing its existing scheme of supporting research and development in emerging eLearning areas under its Technology development Council (TDC) scheme. An estimated annual provision of Rs. 10 – 15 Crores may be provided and the scheme may be popularized by identifying specific areas of development so as to attract large number of organisations for research and development initiatives in this area.

3.4.2.8 Free Availability of the Products, Solutions and Tools from the Research & Development Promoted by DIT under TDC Funding & Hindustan E-Learning Portal (HELP)

Department of Information Technology (DIT) has been funding various Research & Development initiatives under its Technology Development Council (TDC) Funding in several areas including the E-Learning. It is considered necessary to review all such initiatives to know the actual developments and whether the same can be deployed successfully.

It is understood that the Intellectual Property Rights of such developments would rest with the developer institute and the funds provider i.e. DIT. Once these issues are resolved, we must make all such products, solutions and tools, available as free-ware that can be downloaded by any user through the process of filling – up an online form for the purposes of knowing their background and record for our purposes.

It would be good idea if we set up a dedicated portal to E-Learning, which should become local source for E-Learning knowledge, R&D, deployment, Hardware &

Software solutions, Best practices and the downloadable products, solutions & tools.

It would greatly help in cost effective and affordable E-Learning programmes in the country.

3.2.4.9 Awards to Recognize Innovations in eLearning

In order to encourage and recognise developmental efforts and initiatives for deploying ICT in schools, DIT may initiate schemes to reward the innovations including development of high-quality ICT products, digital content, networked applications and exemplary adoption of educational technologies.

It is important to create incentives to support the development and innovative use of high-quality digital content and networked applications. Universities should provide academic/career recognition – recognition that influences tenure decisions – to professors that develop high-quality online learning resources.

Awards by technology industry groups, such as if sponsored by National Association of Software and Services Companies (NASSCOM), will encourage the development of high-quality digital content and networked applications for improved teaching and learning.

To start-with following awards are proposed both at the State and All India levels:

- ▶ Best deployment of ICT in school education
- ▶ Best innovation in development of eLearning solutions
- ▶ Best innovation in development of affordable computing & networking solutions

3.2.4.10 Leverage efforts by NGO & Other Initiatives for ICT in Schools

There are several private initiatives for enabling people in India, especially those in rural areas, disabled and marginalized sections of the society etc. to reap the benefits of the ICT revolution through out the country. Akshya in Kerala, ASHA in

(Suggestions submitted in personal capacity)

Himachal Pradesh, SARI, e-SEVA, Gyandoot in Madhya Pradesh, Lok Mitra/ Jan Mitra in Rajasthan, Bhoomi, Drishtee, TARAhat, Gramdoot, etc. are some of the successful examples.

The above NGOs could be encourages adopting certain number of schools in their area for providing access to ICT in schools including educational content development for students and teachers training and handholding services for making this initiative successful.

Active involvement of corporate sector in such initiatives could be catalyzed by the government, which could include donation of obsolete computers, expert services for development of content, initial orientation programmes / training of teachers and students as per requirement.

Government of India may provide token financial support to these NGOs to encourage them to supplement government efforts in accomplishing the desired results.

- ❖ Make **'Free of Charge eLearning Services Provisioning'** as a mandatory condition for private sector to become part of the Public-Private-Partnership. In fact, this has to be sold as a concept to share the social obligation by the corporate sector.
- ❖ Allow the Public-Private-Partnership to modulate services charges in a manner that they extend eLearning services to the schools free of cost including operation and maintenance support.

ANNEXURE - I

ESTIMATION OF FUNDS REQUIRED TO SUPPORT THE SCHOOLS FOR ICT IN EDUCATION

A typical computer lab with maximum of 20 PCs has been considered for estimating the requirement of funds for providing access to ICTs in government recognised and aided schools in the country.

It is estimated that such a Computer Lab will involve non-recurring capital expenditure of Rs. 7.00 lakh per school and recurring expenditure of Rs. 1.00 lakh per annum per school as per details given below:

CAPITAL COST (NON-RECURRING COST) PER SCHOOL

S.No.	ITEM DETAILS	COST (ESTIMATED) (Rupees in Lakh)
1.	20 Low Cost PCs @ Rs. 10,000	2.00
2.	Server	1.00
3.	Router	1.50
4.	LAN, other accessories & Internet access	0.50
5.	Diesel Generator (5 KVA)	1.00
6.	Software & Educational content	1.00
7.	Total	7.00

RECURRING EXPENDITURE PER ANNUM/ PER SCHOOL

S.No.	ITEM DETAILS	COST (ESTIMATED) (Rupees in Lakh)
1.	Repair and maintenance	0.50
2.	Consumables, internet access & other misc. expenses	0.50
3.	Total per annum	1.00
4.	Total for three years	3.00

(Suggestions submitted in personal capacity)

NOTE: The estimates do not include the cost of land & building, which are supposed to be made available by the school/ administration concerned.

FUNDS NEEDED TO PROVIDE ICT IN SCHOOLS

CAPITAL COST

SCHOOL CATEGORY	NO. OF SCHOOL	COST PER SCHOOL	TOTAL COST
Secondary Schools	1.00 lakh	Rs. 7.00 lakh	Rs. 7000 Crores (US\$ 1.5 billion)
Elementary (Middle Schools)	2.55 lakh	Rs. 7.00 lakh	Rs. 17850 Crores (US\$ 3.8 billion)
Elementary (Middle) & Secondary Schools	3.55 lakh	Rs. 7.00 lakh	Rs. 24,850 lakh (US\$ 5.3 billion)

RECURRING COST PER ANNUM

SCHOOL CATEGORY	NO. OF SCHOOL	COST PER SCHOOL	TOTAL COST
Secondary Schools	1.00 lakh	Rs. 1.00 lakh	Rs. 100 Crores (US\$ 0.22 billion)
Elementary (Middle Schools)	2.55 lakh	Rs. 1.00 lakh	Rs. 255 Crores (US\$ 0.55 billion)
Elementary (Middle) & Secondary Schools	3.55 lakh	Rs. 1.00 lakh	Rs. 355 Crores (US\$ 0.76 billion)

TOTAL CAPITAL AND RECURRING COSTS (Recurring for 3 years)

SCHOOL CATEGORY	NO. OF SCHOOL	CAPITAL COST	RECURRING COST FOR THREE YEARS	TOTAL CAPITAL & RECURRING COST FOR THREE YEARS
Secondary Schools	1.00 lakh	Rs. 7000 Crores (US\$ 1.50 billion)	Rs. 300 Crores (US\$ 0.66 billion)	Rs. 7,300 Crores (US\$ 2.16 billion)
Elementary (Middle Schools)	2.55 lakh	Rs. 17850 Crores (US\$ 3.80 billion)	Rs. 765 Crores (US\$ 1.65 billion)	Rs. 18,615 Crores (US\$ 5.45 billion)
Elementary (Middle) & Secondary	3.55 lakh	Rs. 24,850 lakh (US\$ 5.30 billion)	Rs. 1065 Crores (US\$ 02.30 billion)	Rs. 25,915 Crores (US\$ 7.60 billion)

FUNDS REQUIREMENT FOR PHASED IMPLEMENTATION OVER THREE YEARS (2008-2009 TO 2010-2011)

PHASING & REQUIREMENTS OF FUNDS BY DEPARTMENT OF INFORMATION TECHNOLOGY DURING 2008-2009 TO 2010-2011

SCHOOL	2008-2009	2009-2010	2010 - 2011	TOTAL
Secondary Schools	Rs. 2435 Crores (US\$ 0.72 billion)	Rs. 2435 Crores (US\$ 0.72 billion)	Rs. 2430 Crores (US\$ 0.72 billion)	Rs. 7,300 Crores (US\$ 2.16 billion)

(Suggestions submitted in personal capacity)

Elementary (Middle Schools)	Rs. 6,205 Crores (US\$ 1.85 billion)	Rs. 6,205 (US\$ 1.80 billion)	Rs. 6,205 (US\$ 1.80 billion)	Rs. 18,615 Crores (US\$ 5.45 billion)
Elementary (Middle) & Secondary Schools	Rs. 8,6340 Crores (US\$ 2.55 billion)	Rs. 8,6338 Crores (US\$ 2.55 billion)	Rs. 8,6337 Crores (US\$ 2.50 billion)	Rs. 25,915 Crores (US\$ 7.60 billion)

ANNEXURE - II

KEY ELEMENTS OF 21ST CENTURY LEARNING

1.0 Introduction:

The 21st century demands central and state initiatives to give students a solid foundation on core subjects and core content and to monitor progress with assessment and accountability measures.

There are several missing key elements, specifically those required for business applications of ICTs, in which the ICT professionals need to be trained. Adding these key elements where they are missing – and measuring them with 21st century assessments – will make the core subjects relevant to the world in which students live and eventually may work. Moreover, these key elements will help improve student achievement; more effectively address the needs of students with special challenges, such as foreign language (say Japanese to enter Japanese market) and students with disabilities; and help schools meet the intent of National Goal of **Education For All (EFA)**.

2.0 Elements of 21st Century Education:

Various studies by industry and institutional professionals have indicated that to strengthen core subjects and move towards 21st century education, there is six elements schools can incorporate:

- 1 Emphasize core subjects**
- 2 Emphasize learning skills**
- 3 Use 21st century tools to develop learning skills**

- 4 The Importance of Integrating ICT Literacy:
- 5 **Teach and learn in a 21st century context**
- 6 **Teach and learn 21st century content**
- 7 **Use 21st century assessments that measure 21st century skills**

2.1 Emphasize core subjects:

It is a universal fact that the core academic subjects remain the foundation of a good education. Also our understanding of core subjects and students course-taking patterns in these subjects continue to evolve to respond to the changing times.

Another conclusion drawn from the above studies is that in high school students must learn core subjects early since exposure to subjects at the elementary level is related to courses students take at the secondary level. The more content they are taught early, the more they learn and the better they perform on later achievement tests.

The demand of the 21st century workplaces has been identified as English, mathematics, science, foreign languages, civics, government, economics, arts, history and geography. In the global economy, a foreign language, economics and geography are “new basics” for functioning effectively.

Therefore, government, industry and academia must develop academic content standards / core technical profile, which should spell out clearly what students should know and be able to do. The schools thereafter, must make sure these standards are aligned with assessments.

2.2 Emphasize learning skills:

To cope with the 21st century demands, people need to know more than core subjects. They need to know how to -

- Use their knowledge and skills – by thinking critically,
- Applying knowledge to new situations,
- Analyzing information,

(Suggestions submitted in personal capacity)

- Comprehending new ideas,
- Communicating,
- Collaborating
- Solving problems and
- Decision-making.

LEARNING SKILLS	TABLE 1
INFORMATION & COMMUNICATION SKILLS	<p>INFORMATION & MEDIA LITERACY – Analyzing, accessing, managing, integrating, evaluating & creating information in a variety of forms & media. Understanding the role of media in society.</p> <p>COMMUNICATION SKILLS – Understandings, managing & creating effective oral, written and multimedia communication in a variety of forms & contexts.</p>
THINKING AND PROBLEM -SOLVING SKILLS	<p>CRITICAL THINKING & SYSTEMS THINKING – Exercising sound reasoning in understanding & making complex choices, understanding the inter-connections among systems.</p> <p>PROBLEM IDENTIFICATION, FORMULATION & SOLUTION Ability to frame, analyzes and solves problems.</p> <p>CREATIVITY & INTELLECTUAL CURIOSITY – Developing, implementing & communicating new ideas to others, staying open & responsive to new & diverse perspectives.</p>
INTERPERSONAL AND SELF-DIRECTIONAL SKILLS	<p>INTERPERSONAL & COLLABORATIVE SKILLS – Demonstrating teamwork & leadership; adapting to varied roles & responsibilities, working productively with others, exercising empathy; respecting diverse perspectives.</p> <p>SELF-DIRECTION – Monitoring one’s own understanding & learning needs, locating appropriate resources, transferring learning from one domain to another.</p> <p>ACCOUNTABILITY & ADAPTABILITY – Exercising personal responsibility & flexibility in personal, workplace & community contexts; setting & meeting high standards & goals for one’s self & others; tolerating ambiguity.</p> <p>SOCIAL RESPONSIBILITY – Acting responsibly with the interests of the larger community in mind; demonstrating ethical behavior in personal, workplace & community context.</p>

Additionally they must also possess personal qualities of -

- Responsibility,
- Self-esteem,
- Sociability,

- Self—management,
- Integrity/ honesty,
- Behavior,
- Team work and
- Critical thinking,

“The aim of education is to enable individuals to continue their education ----- The objective and reward of learning is continued capacity for growth”, Philosopher John Dewey.

Further, following learning skills are equally valuable outside the workplace (but they do impact the workplace directly or indirectly) –

- ▶ Making intelligent customer choices
- ▶ Raising children
- ▶ Participating in civic affairs and
- ▶ Evaluating media perspectives

Detailed list of Learning Skills needed in 21st century is given in **Table-1**.

People need high-level learning skills to act, respond, learn and adjust to ever-changing circumstances. As the world grows increasingly complex, success and prosperity will be linked to people’s ability to think, act, adapt and communicate creatively.

All of these require people to access and assess information to solve problems, act constructively and make decisions.

Hence survival in the 21st century would be possible only with developing proper learning skills.

2.3 Use 21st century tools to develop learning skills:

As emphasized elsewhere in the report, the technology will continue to be a driving force in workplaces, communities and personal lives in the 21st century. Technology helps prepare students for the workforce when they learn to use and apply applications used in the world of work. When content and strategies meet accepted education standards, research shows that technology increases mastery of vocational and workforce skills and helps prepare students for work when emphasized as a problem-solving tool.

The technology tools that we are discussing here are information and communication technology tools, which include computers, networking and other technologies plus audio, video and other media and multimedia tools – spreadsheets for calculations, graphic and multimedia programmes for presentations, databases for research and networks for communicating with others.

There is a general convergence of thoughts that students need to learn how to use 21st century tools beginning elementary school itself to take full advantage of the vast array of research and multimedia resources, digital content and communications options available to them.

2.4 The Importance of Integrating ICT Literacy:

Together, learning skills and 21st century tools – knowing how to use these tools to perform learning skills – represent ICT literacy. In other words ICT literacy means harnessing technology to perform learning skills, such as communicating effectively with presentation software or juggling personal responsibilities with a personal digital assistant.

Developing ICT literacy requires good leadership, a strong technology infrastructure, adequate & equitable access to technology & Internet in Schools, integration of technology with classroom learning & adequate methods for assessing ICT literacy.

Integrating ICT literacy into core subjects is the best way to teach. Today, educators have the opportunity to integrate learning skills, 21st century tools

and core subjects to create a vibrant education for their students. The 21st century tools increasingly are critical enablers of learning skills.

Please see the Table – 2 of recommended ICT literacy framework for better understating and clarity.

TABLE - 2		
ICT LITERACY FRAMEWORK FOR THE 21ST CENTURY		
LEARNING SKILLS	21ST CENTURY TOOLS	ICT LITERACY
THINKING & PROBLEM SOLVING SKILLS	Problem-solving tools (such as spreadsheets, decision support, design tools)	Using ICT tom manage complexity, solve problems & think critically, creatively & systematically.
INFORMATION & COMMUNICATION SKILLS	Communication, information processing & research tools (such as word processing, email, groupware, presentation, web development, Internet search tools)	Using ICT to access, manage, integrate, evaluate, create & communicate information.
INTERPERSONAL & SELF-DIRECTING SKILLS	Personal development & productivity tools (such as e-learning, time management/ calendar, collaboration tools)	Using ICT to enhance productivity and personal development.

2.5 **Teach & Learn in a 21st Century Context:**

Good teachers have always helped students discover the value and relevance of new skills and knowledge. Because children now live in a world of almost unlimited streams of trivial and profound information, of enormous opportunity and difficult choices, helping students make vital practical, emotional and social connections to than ever. Towards this, teachers can create 21st century context for learning by –

- ▶ Making content relevant to student’s lives;
- ▶ Bringing the world into the classroom; and
- ▶ Taking students out into the world; Creating opportunities for students to interact with each other, with teachers and with other knowledgeable adults in authentic learning experience.

Teachers can use the community as a learning lab. Today, technology makes it possible to bring the world into the classroom and to get students out in the world with “virtual’ outreach and excursions into the physical world. These connections are critical to developing students engagement, motivation and attitudes about learning. By teaching in 21st century context, educators can create a balanced education that reflects both national concerns and local needs.

2.6 Teach & Learn 21st Century Content:

We want our schools to prepare students for the world. We expect the next generation to preserve and strengthen our democracy. Towards this, the schools need to increase their emphasis on following three areas:

2.6.1 Global Awareness:

Indians live in increasingly diverse communities and many works for businesses involved in global commerce. Technology is obliterating geographic boundaries and time zones, collaboration and communication across these boundaries is now commonplace. In this environment people need a deeper understanding of the thinking, motivations and actions of different cultures, countries and regions. Global awareness promotes understanding, tolerance and acceptance of cultural, religious and personal differences as they play out in communities and workplaces. It also helps people work through the complexities of different points of view that spring from different parts of the world.

2.6.2 Financial, Economic & Business Literacy:

Both personally and professionally, people are reasonable for making sophisticated economic and business choices that will affect their futures profoundly. Look at the following questions -

- ⇒ *“Will a college degree improve my earnings?”*
- ⇒ *“Where should I invest my money?”*
- ⇒ *“Is it smarter to buy or lease a car?”*
- ⇒ *“Should I consolidate my debt with a home equity loan?”*

⇒ *“Why save for retirement now?”*

These everyday choices can result in personal prosperity – or in poor financial decisions, debt or even bankruptcy. Yet most people receive no schooling in these topics. As a result, “cumulative effect of millions of financially illiterate persons, unable to meet financial goals for themselves and their families, has large- scale national implications.

Similarly, most people enter workplaces after high school or college without even a rudimentary understanding of business processes, entrepreneurial spirit or economic forces that shape their lives.

- ⇒ *“How does my performance affect my company’s success?”*
- ⇒ *“How can I support and contribute to my organization’s goals?”*
- ⇒ *“What value do I add to the enterprise?”*
- ⇒ *“Can I evaluate a proposal and determine if it is a good business opportunity?”*
- ⇒ *“Will this person be a good fit on my team?”*

Understanding these business issues can help people move ahead or fall behind in their careers. Financial, economic and business literacy will help people better manage their personal finances and contribute more productively in workplaces.

2.6.3 Civic Literacy:

A progressive nation needs informed and responsible citizens to participate in the political process. How many Indians are exercising their civic rights and responsibilities? Civic literacy can help students understand, analyze and participate in government and in community, both globally and locally. Citizens should make decisions and reflect an understanding of historic implications, the role of leaders and a broader sense of political awareness.

Schools may not necessarily create new courses to incorporate this in 21st century content into their classrooms. Rather, they can infuse this content into core subjects or use it in contextual learning experiences.

See the 21st century content requirements summarized in **Table-3** below:

21ST CENTURY CONTENT		Table 3
GLOBAL AWARENESS	<ul style="list-style-type: none">⇒ Using 21st century skills to understand & address global issues⇒ Learning from & working collaboratively with individuals representing diverse cultures, religions & lifestyles in a spirit of mutual respect & open dialogue in personal, work & community context⇒ Promoting the study of non-English language as a tool for understanding other nations and cultures	
FINANCIAL, ECONOMIC & BUSINESS LITERACY	<ul style="list-style-type: none">⇒ Knowing how to make appropriate personal economic choices⇒ Understanding the role of the economy & the role of business in the economy⇒ Applying appropriate 21st century skills to function as a productive contributor within an organizational setting⇒ Integrating oneself within & adapting continually to our nation's evolving economic & business environment	
CIVIC LITERACY	<ul style="list-style-type: none">⇒ Being an informed citizen to participate effectively in government⇒ Exercising the rights & obligations of citizens at local, state, national & global levels⇒ Understanding the local & global implications of civic decisions⇒ Applying 21st century skills to make intelligent choices as a citizen	

2.7 Using 21st Century Assessments that Measure 21st Century Skills:

At the end, the most important aspect is that of assessment and measurement of skills.

There are following three overarching points about assessment and accountability, which need to be properly integrated in the entire education process:

- 2 Standardized tests must measure both core subjects and 21st century skills i.e. we must measure what we value – or it won't be taught.

(Suggestions submitted in personal capacity)

- 3 Standardized tests must be balanced appropriately with classroom assessment to measure the full range of the student's skills in a timely way.
- 4 Classroom assessments must be strengthened and integrated with the instructional process to reinforce learning, provide immediate feedback and help students learn core subjects and 21st century skills.

The above field of assessments and measurements is a challenging field that demands further study and innovations. The major issues to be tackled in the future are –

- Standardized tests can measure only a few of the critical skills and knowledge that we hope our students will learn.
- Standardized tests alone do not provide the immediate diagnostic information that teachers, parents and students need to make decisions in the classroom or improving learning in real time.
- Effective classroom assessments must integrate classroom teaching and learning, going beyond tests at the end of a lesson and providing immediate feedback to teachers and students on performance. Project-based assessments, for example, feature such characteristics as real-life contexts, everyday problems, the application of the content to solve problems and the use of appropriate technologies.

(Suggestions submitted in personal capacity)

ANNEXURE – III

**List of Recognised Educational Institutions in India
upto 2004 – 2005**

S.No	State/UT	Primary/ Junior Basic Schools	Middle/ Senior Basic Schools	High Schools/ Hr. Secondary/ Intermediate / Pre-degree/ Jr. College	DEGREE AND ABOVE LEVELS		
					Colleges General	Colleges Professional	Universities/ Deemed
1.	Andhra Pradesh	61680	16667	17710	1340	406	25
2.	Arunanchal Pradesh	1371	495	214	10	4	1
3.	Assam	30068	8143	5374	317	50	7
4.	Bihar	39347	10963	3629	743	45	7
5.	Chattisgarh	33595	10799	2670	213	5	5
6.	Goa	1003	73	445	23	13	1
7.	Gujarat	16385	22623	7718	507	216	20
8.	Haryana	11800	2269	5222	166	113	9
9.	Himachal Pradesh	11178	2210	2341	89	33	7
10.	J & K	12049	4239	1347	50	137	9
11.	Jharkhand	16572	4933	1196	117	22	8
12.	Karnataka	26645	26816	11818	930	360	27
13.	Kerala	6827	3049	5402	186	127	9
14.	Madhya Pradesh	96737	34641	8301	760	109	21
15.	Maharashtra	41669	26295	18717	1208	450	42
16.	Manipur	2552	831	706	58	5	2
17.	Meghalaya	5851	1759	711	54	2	1
18.	Mizoram	1481	939	512	26	2	1
19.	Nagaland	1520	480	379	37	1	1

(Suggestions submitted in personal capacity)

20.	Orissa	45700	15893	8661	700	80	15
21.	Punjab	13352	2503	3980	212	100	10
22.	Rajasthan	55942	26201	10144	611	117	25
23.	Sikkim	684	185	161	2	4	2
24.	Tamil Nadu	33470	7111	9234	445	362	41
25.	Tripura	1776	1001	652	14	3	1
26.	Uttar Pradesh	129976	36874	12766	1009	224	41
27.	Uttaranchal	14663	3861	1855	86	4	9
28.	West Bengal	50397	1929	7971	374	139	26
29.	A&N Islands	213	58	95	3	1	0
30.	Chandigarh	25	8	118	12	9	4
31.	D&N Haveli	127	91	22	0	0	0
32.	Daman & Diu	53	24	28	1	1	0
33.	Delhi	2463	635	1712	63	41	17
34.	Lakshadweep	21	6	11	0	0	0
35.	Pondicherry	328	127	227	11	16	1
	TOTAL	767520	274731	152049	10377	3201	407

Source: University Grants Commission Annual report 2004-2005