India In the Global Community Through Advanced Networking

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Science, Education & Knowledge Economy

- Research
- Teaching – Human Resource Development

Research In India

- Current scenario
  - 2.5% of the world's research output
  - <0.6% considered of quality research papers
  - Limited infrastructure
  - Individual oriented research laboratories
  - Information gap
  - Repetitive research
  - Little effort to convert research results into technology/product

Research In India

- Current Needs
  - Networking amongst scientists within India
  - Networking with scientists around the world
  - Effective use of existing infrastructure
  - Improvement in library and laboratory facilities
  - Increased number of quality researchers all over the country vs. islands of excellence

Networking Advantages

- Cutting edge disciplines like biotechnology & bioinformatics, nanosciences, biodiversity, energy studies, instrumentation etc.
- Expensive equipment/facilities such as accelerators, high resolution telescopes, macromolecular structural study equipment, six dimensional virtual reality centers, grid computing
- Sharing of expertise

Education In India

- Current scenario
  - Few universities/institutes provide quality world class education
  - Highly rigid structure
  - Poor quality of infrastructure and instructors
  - Method of teaching not conducive to learning culture
  - Consequence – wide gap between societal needs and training imparted

Education In India

- Current Needs
  - Increase in quality man power at various levels
  - Higher investment in education sector
  - Improvement in infrastructure
  - Change in institutional governance
  - Change in monitoring system
  - Flexibility

Advantages of Networking

- Networking amongst the Indian universities and institutions
  - Optimal usage of available teachers, infrastructure
- Networking with universities and institutions globally
  - New courses delivered through virtual class rooms and virtual laboratories
  - Particularly important for new and upcoming areas
  - Access to best practices around the world

Current Network Status

- Very few institutes and universities connected through reliable network
- Limited bandwidth - in kbps range at most places, mbps at few places
- Few virtual private networks for science and education (Biogrid)
- Ernet, NICNET making major efforts

Difficulties

- Limited or no access to digitized journals & books – wide information gap
- Very few virtual classrooms; no virtual laboratories
- Difficulty in sharing information with colleges and other universities
- Very few collaborations at teaching and research levels - national and international
- Best practices remain localized

Broadband Advantages

- Joint Ph.D. programs
- Joint research projects
- Utilization of major international facilities and real time experimentation and analysis of data
- Bridging the quality gap in teaching and developing a learning culture

Case Studies

- Bioinformatics - structural genomics, metabolic pathway engineering & system biology
- Biocomplexity and biodiversity
- Instrumentation
- Atmospheric sciences and disaster management
- Telemedicine

Thank you

Questions????