

# Impact of Science and Engineering Research University in Developing Countries

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# IIT System

- ◆ Institute of national importance by Act of Parliament
- ◆ 7 Institutes
- ◆ Autonomous and Separate entities
- ◆ Government Funded
- ◆ About 25000 students
- ◆ 2000 Faculty members
- ◆ 400 Ph.D and 1600 Masters in Technology every year

# IIT Kanpur

- ◆ Established in year 1960 with U.S. Collaboration
- ◆ 400 + Academic staff
- ◆ 4000 students    800 PhD  
1200 Masters
- ◆ 13 Departments    5 IDP    Research center
- ◆ 1000 acres of residential Campus
- ◆ 200+ Research Labs

# Funding

- ◆ About 60 % ( 1000 Million INR )  
Government
- ◆ About 25% ( 400 Million INR )  
Research Grants + Consultancy +  
Training
- ◆ About 8% ( 120 Million INR) Interest  
on endowment and other funds
- ◆ About 7% ( 100 Million INR ) Fees  
etc

# Impact

- ◆ Setting up Standards of Technology and Science Education at par with Developed countries
- ◆ Technical Manpower ready to meet challenges of Future

Case in Point Importance of Computer Science Teaching in IIT K from beginning  
Provided Industry leaders in this area when opportunity arrived 20 years later

# Manpower

- ◆ Learning aimed at innovative thinking with ability to learn and practice dynamically changing technologies
- ◆ Research trained Manpower to provide self sustenance in “Closed door” areas
- ◆ Act as catalyst to change : a must for developing economies who have to learn to cope with competition with developed economies

# Industrial Development

- ◆ Creating technical entrepreneurs in High Tech areas
- ◆ Providing knowledge bank for technologies
- ◆ Catalyst for development of research interface in Industry ,a must to sustain growth in the second stage of economic development
- ◆ Case in point Biotechnology / Pharma Industry

# Mechanisms to retain--

- ◆ First stage of development (Indian Economy till 1985)

- ◆ Job challenge Limited due to  
No R&D

Non Competitive Industry

- ◆ Challenges only in Defense, R & D,  
Space, Atomic energy etc.

Large scale Migration

# Mechanisms to retain-----

Second stage of Development 1990

High Tech Industry

Global Reach

Competition

Industrial R & D

Global sourcing Hub

Higher Retentively and Return Back



# Impact

Retentivity = (Financial Benefits)\*  
(Challenging job opportunities) +  
(Society

ability to nurture entrepreneurship)

Institute interaction with industry =

Industries research focus \*

competition\*long term perspective of  
growth



# Research Universities Contribution

Research Contribution to Economic development

- ◆ Initial phases Manpower
- ◆ Next Phase Research Universities acting as catalyst to Technology assimilation
- ◆ Growth phase Acting as backyard for industrial Research and Technology development

# Research University Contribution

- ◆ Seed for generation of Ideas to be converted in product and services through a chain Needs Substantial Investments on the part of Industry in R & D
- ◆ Academic Research → Industry Research → Production

# Stake holders

- ◆ Impact of Research has a large time lag with Investments

Be Patient

