

PhD Programs – the Ignored Imperative

Pankaj Jalote

Dept. of Computer Sc. And Engg.

I. I. T. Kanpur

India - 208016

jalote@iitk.ac.in

© P. Jalote

Outline

- ⌘ Value of PhDs to the Nation
 - ☒ Relationship to education
 - ☒ Highest end of value chain – R&D
 - ☒ Innovation and IPR
- ⌘ Increasing PhD production
 - ☒ Increase source base
 - ☒ Set targets for top institutes
 - ☒ Incentivise individual R&D

PhD Programs in India

- ⌘ Most education institutes are primarily teaching-oriented
- ⌘ Even IITs are primarily education-oriented
- ⌘ PhD programs and research is not taken seriously almost anywhere
- ⌘ An underlying belief – PhD a luxury, an over-qualification, not really relevant to India's development

PhD Programs and Research

- ⌘ Research is a religion in western univs
 - ☒ Even "lower rung" univs take it seriously
 - ☒ No one questions "why research?"
 - ☒ Value and relevance to society unambiguous
- ⌘ Why we treat research as not important
 - ☒ Irrelevant to society – need basic education; industry doesn't need R&D,...
 - ☒ Is a "western ideal"
 - ☒ No systemic incentives

Basic Thesis of the Talk

- ⌘ Increasing PhDs is an imperative for us in the current scenario
 - ☒ Cannot keep education up-to-date; newer opportunities to tap; world shifting to IPR,..
- ⌘ “Out of Box” thinking needed to enhance PhD programs

PhD and Technical Education

- ⌘ We boast of the 3rd largest technical manpower – but training is poor
- ⌘ Main cause of poor training – poor faculty
- ⌘ Two key requirements for good teacher
 - ☒ Possess higher level of knowledge than teaching in the course
 - ☒ Ability to track trends and assimilate new knowledge in courses

Technical Education...

- ⌘ Both conditions are satisfied by PhD
 - ☒ Gives depth/expertise in a subject
 - ☒ Provides training to spot trends, self-learn new material, use new knowledge,..
- ⌘ Relationship between education and Research not well understood in India
 - ☒ Heavy correlation between top R univs and top education places

PhD and Development of Corporate R&D

- ⌘ This is a new window of opportunity
- ⌘ R&D costs very high in the world
- ⌘ Companies looking to set R&D centers in India
- ⌘ Bottleneck – avail. of high quality PhDs
- ⌘ Imagine the scenario – 100s of PhDs in Bio, Science, Engg, CS available...
 - ☒ Attracting R&D centers will be sooo easy...

Innovation and IPR

- ⌘ Most sought after skills today – Creativity
- ⌘ PhD is the only degree that emphasizes knowledge creation (& not learning)
- ⌘ Ability for IPR creation is a key strength
- ⌘ Cannot enhance it without a big leap in PhD production

Enhancing PhD Production

Increasing PhD production

- ⌘ Is inherently slow – today's initiatives will show results 5 years later
- ⌘ Limited role of businesses in this
- ⌘ Govt and educational places are the key
- ⌘ "Out of Box" thinking, innovative approaches, needed

Widen the Source Base

- ⌘ Currently, we focus on fresh graduates
- ⌘ Must widen the source base to include working professionals
 - ☒ Is an important source world over
 - ☒ Requires flexibility in phd programs
 - ☒ Need "married student" scholarship
- ⌘ Should support "cross migration"

Premier Institutes/Labs should set Clear Targets

- ⌘ Increase in PhDs has to be anchored by top places – graduates from them will seed other places in due course
- ⌘ One approach – top 10 places in each discipline should set a goal of graduating 10 PhDs each year
 - ☒ Will require govt backing
 - ☒ Innovation in recruitment

Create Incentives for Enhancing individual R&D

- ⌘ No scheme will work unless the faculty and researchers want to do more research
- ⌘ Currently no systemic incentive for this
- ⌘ Must build individual incentives – one approach is to have variable increments based on R&D performance
- ⌘ System incentives based on R&D performance are also needed

Summary



- ⌘ Increasing PhD production is an imperative India can no longer ignore
 - ☑ Necessary for education quality, becoming R&D center of the world, IPR creation,...
- ⌘ Need fresh initiatives to increase prodn.
 - ☑ Increase source base; top institutes set a target of 10 per year in each discipline,..