



Economics of Education for Innovative Capacity

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ICA Conference
March 3, 2007

Is the World Really Flat?

- ⌘ Realization of Neoclassical Economics
 - Featureless Plane
 - Resources flow freely
 - Outcome is equalization
- ⌘ Or is the World Spiky?
 - Innovation clusters both
 - Temporally
 - Spatially
- ⌘ Multinationals see the world as flat
- ⌘ Skilled labor appreciates the spikes
- ⌘ We are here as a temporary agglomeration of scholars

Location Matters

- ⌘ Geography is a flavor (Starbucks)
 - More than the sum of the parts
 - Historical context
 - Path dependency
- ⌘ Knowledge Characteristics
 - Tacitness v Codified
 - I can say more than I can write and I know more than I can say
- ⌘ Epistemic Communities?
 - Substitute or complement for location?
 - If you know what you are looking for
- ⌘ We come together as a temporary agglomeration of scholars
- ⌘ Geographic Concentrations of Innovation
 - Not due to concentration of resources or production

Economic growth is a local phenomenon

- ⌘ Locus of innovative activity
 - Innovation as cognitive, contextual process
 - Predicated on face to face interaction
 - common meaning and language
 - Firms are main innovators
 - Firms benefit through strategic location
 - Not by relocation but by investing
 - Ecosystems of Innovation
- ⌘ Innovation as a cognitive, social processes
- ⌘ Innovation processes are grounded
- ⌘ Difficult to anticipate, predict and plan new technologies
- ⌘ Higher Education's increased prominence
 - Engines of economic development
 - Great expectations & experimentation



**”Silicon Valley is probably the
only place on earth not trying
to copy Silicon Valley”**

Robert Metcalfe, 1998

Emerging Industries

- ⌘ Platform Technologies
 - Schumpeter's long waves of economic growth
 - Opens opportunity for incremental investment

- ⌘ Difficult to anticipate, predict or even appreciate
 - Consider the Internet
 - New Disciplines
 - Baumol's Computer Paradox
 - Easy to give up

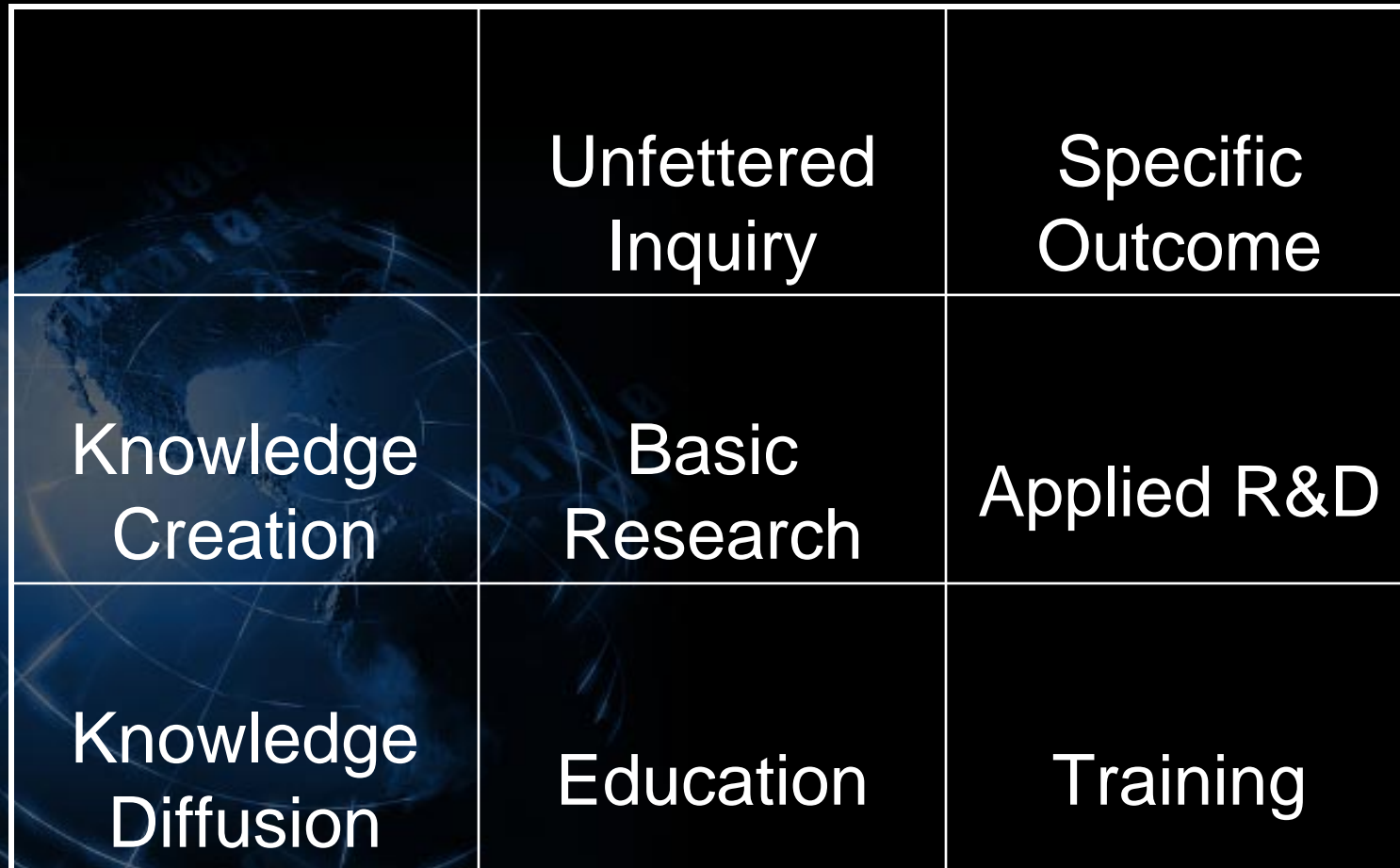
- ⌘ Co-location & related diversity
 - Right Place, Right Time
 - Science as a race?
 - Discoveries are infinitely adaptable & recombining
 - Not replication

- ⌘ Fortune favors the prepared region
 - Apologies to Pasteur
 - Ability to understand & augment new technology

Economic Development Consideration

- ⌘ Government Induced Clusters
- ⌘ Innovative systems
 - Complex, self-organizing systems
 - Can we really anticipate new technology?
 - Healthy ecology of actors & institutions
 - Reinforcing and redundant systems
- ⌘ Strategic Problem – doing something differently
- ⌘ Regions have differential capacity to absorb university outputs
 - Different industrial profiles
 - Different supporting resources to turn inventions into innovation
 - Different ability to grow and sustain companies
- ⌘ Designing economic development strategy may be the ultimate local innovation

Education for Innovation



	Unfettered Inquiry	Specific Outcome
Knowledge Creation	Basic Research	Applied R&D
Knowledge Diffusion	Education	Training

Chemical plant capacity use:
slowed business brings shutdowns
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Chemical &
Engineering

NEWS

October 12, 1981



02546320121 1 N AR5941SF 1
DR WILLIAM J RUTTER
UNIV CALIFORNIA
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SAN FRANCISCO CA 94143

Biotechnology on campus

Business, academia in potential conflict of interest

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Education as a Craft Industry

- ⌘ Baumol and Bowen Paradox
 - Beethoven's String Quartet
 - Gestation of a Human Person

- ⌘ Education
 - Versus training
 - Codified knowledge
 - Occupations easily deskilled
 - Mass education vs. Personalized education
 - On-line & distance education
 - For-Profit Education

- ⌘ Life-long process
 - Technological change
 - Economic restructuring

- ⌘ Successful careers balance training with education

Can Current Strategies Lead to Innovation?

- ⌘ Paradox of engineering innovation
 - Crisis in Pharmaceutical R&D
 - Human Creativity, Serendipity, Luck
- ⌘ Privatization of Knowledge
 - Business model in Knowledge Economy
 - Public good diminished
 - Justification for public funding
- ⌘ Rankings, Ratings and Beauty Contests
 - Are private sector metrics transferable
 - Emphasis will shift to the measurable
 - Assessment force conformity
 - Drives out diversity and experimentation

The U.S. Higher Education System

- ⌘ Emphasis on Market Driven Outcomes
 - From Investment Good to Consumption Good
 - Funding tied to student promotes choice yet perverse outcomes
 - Majors
 - Facilities
 - Luxury Good
- ⌘ Formal Technology Transfer
 - The dirty little secret.....
 - Threats to open science
 - Focus on immediate problems
- ⌘ Competition among Institutions
 - Ratings force conformity
 - From state to World-Class Institutions
 - Access diminished

Chindia?

- ⌘ Really so very different & unique
- ⌘ Developing competencies
 - India in services, reach back to manufacturing
 - China in manufacturing, reach forward to R&D
- ⌘ Brain Circulation
 - Not Drains or Gains
 - Declining US Prominence
 - Developing capacity
 - Increased opportunity
- ⌘ Scale advantages
- ⌘ Limiting Constraints
 - India
 - Water!
 - Poverty
 - China
 - Pollution
 - Regional distribution

What is the Role of Government?

- ⌘ Private activity is the Tip of the Iceberg
 - What enables innovation?
 - Capacity
 - Incentives
 - Institutions
 - Role of Government
 - Philosophical question
 - Diminished yet rise of non-profits foundations
- ⌘ Slow spiral of human progress
 - Balance between public/private
 - Pendulum ready to swing again
- ⌘ Economic development is increasingly about social policy
 - Winner take all or casino economy

If Innovation is the Desired Outcome

⌘ Focus on Education

- Broad-based education
- Ability to think creatively, write and analyze
- Different from training
 - Noted problems with MBA education

⌘ Focus on Basic Research

- Yields/build out new platforms
- Long time horizons, important small steps
- Applied R&D yields incremental ideas
 - More predictable

⌘ Focus on local capacity

- Build on existing expertise
- Focus on local problems
- Move to global markets

Reflective Conclusions

- ⌘ Creativity & innovation are about doing things differently
 - Will we force conformity & kill the desired outcomes
 - when we think about teaching innovation and creativity
 - Focus on measurement
 - You can't teach innovation & entrepreneurship at a B-School

- ⌘ Innovation to what end?
 - Amelioration of disease and human suffering
 - Time for a new golden age
 - Alternative is treating knowledge as a commodity
 - Human beings as skilled factor inputs to production