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# The Role of Firms' HRM practices in Building Human Resources for Industrial Innovation in Developing Countries

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# AGENDA

- Human Resources for Innovation: Traditional view
- The Other Side of the Story
- Firms contribution to development of HR
- Surfing the background literature
- The Scope of this Research
- Methodology

# Human Resources for Innovation: Systems Perspective

- Supply-biased approach. (Lundvall, 1992; Hemmert, 1998; Lundvall et al., 2002)
- International League Tables. (Lichtenberg, 1994; Pattel & Pavitt, 1994; Freeman, 1995; Mani, 2002)
- Demand-related factors: economy's and firms' absorptive capacity for HR. (Alcorta & Peres, 1998; Valenti, et al., 2000; Chang & Shih, 2004; Texeira, 2004)
- Education: Linear model in systems of innovation. (Bush, 1945; Nelson, 1959; Pavitt, 1998; Edquist, 1997; Smith, 2000)

# The Other Side of the Story

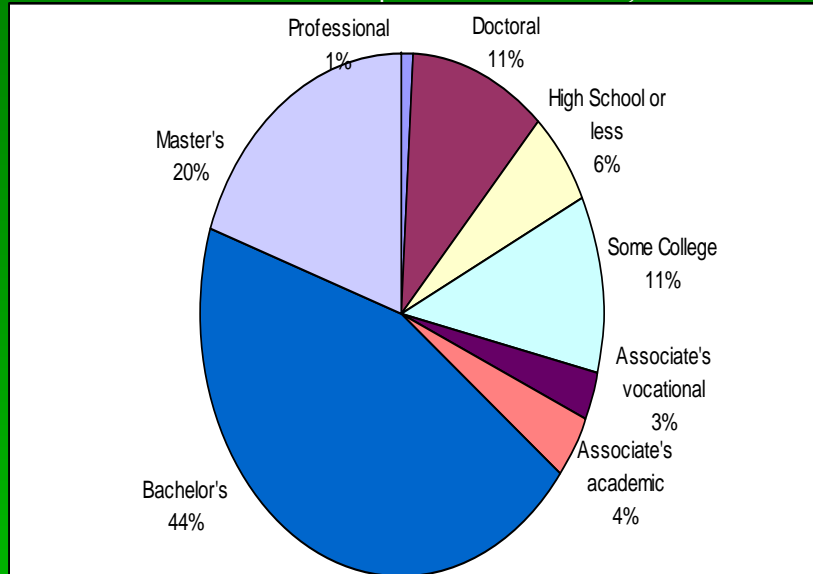
- Increased awareness: dynamics of markets HR; organization, knowledge creation, learning, development and management of HR in firms and networks. (Hemmert, 1998; Lundvall et al., 2002; Coriat & Weinstein, 2002; Johnson & Lundvall, 2003)

→Changing modes knowledge production-use. (Gibbons et al., 1994; Johnson & Lundvall, 2003)

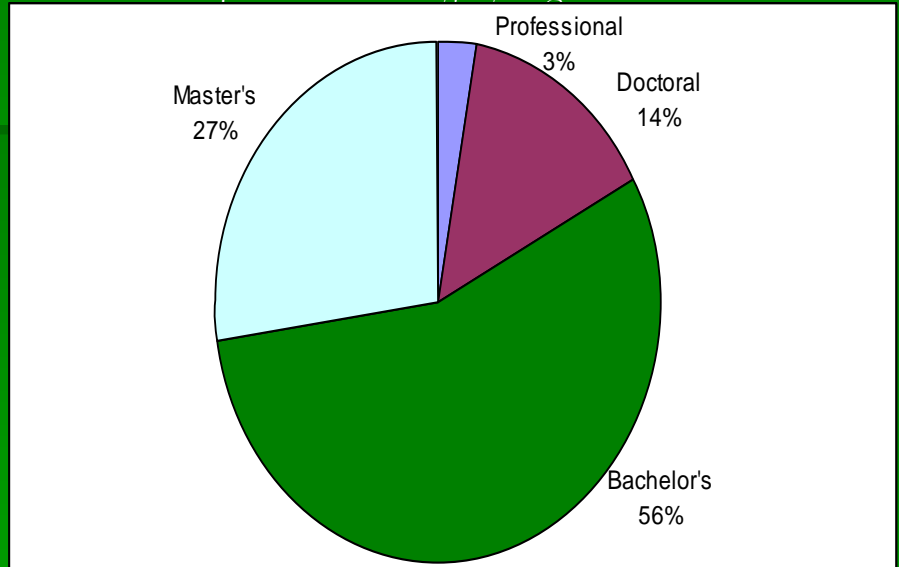
→Do Firms' contribute to development of HR for innovation? (Hemmert, 1998; Michi & Sheehan, 1999 & 2003; Laursen & Foss, 2003; Terziovski & Morgan, 2004 )

# Who Performs R&D in the US?

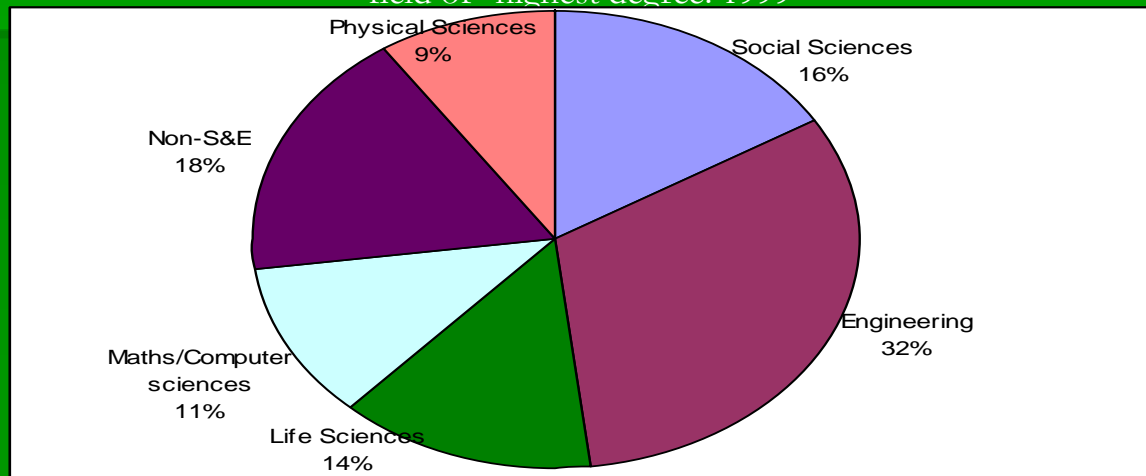
Educational distribution of individuals in non-academic S&E occupations in the US, 2000



Distribution of S&E-degree workers with R&D as major work activity, by degree level: 1999



Distribution of S&E-degree workers with R&D as major work activity, by field of highest degree: 1999



# Firms Contribution to Development HR for innovation

- 4 intertwined interactive dimensions:
  - Organization of both production and innovatory activities. (Kidder, 1982; Lundvall, 1988 & 1992; OECD, 1998 & 1999; Mumford, 2000)
  - Personnel characteristics, HRM practices. (Hemmert, 1998; Michi & Sheehan, 1999 & 2003; Laursen, 2002; Laursen & Foss, 2003)
  - Knowledge required, generated and used within firms. (Gibbons & Johnston, 1974; Faulkner, Senker & Velho, 1995; Smith, 2000; Salter & Gahn, 2000; Laursen & Salter, 2004)
  - Complex interactions with the environment. (Hemmert, 1998; Zanko et al, 1998 Carlsson et al, 2002; Lundvall, et al, 2002; Okada, 2004)

# Management Studies

- Linkage HRM-innovation better established in management literature, -e.g. R&D-personnel. (e.g. Katz, 1988; Mumford, 2000)

- Attention on creativity, attractiveness, motivation, productivity R&D personnel. (Badawy, 1988; Alic, 1995; Gupta et al, 1993; Debackere, et. al., 1997; Mumford, 2000)

- Management orientation: mostly descriptive and prescriptive. (Nelson, 1991; Zanko et al., 1998; Michi & Sheehan, 2003)

- Focus on specific aspects of particular HRM policies;

- “Best-practices”, “role-models”;

- Failure: relationship firms’ internal innovatory processes and environment.

# Economics & Innovation

- ‘High-performance work-practices’, ‘high-performance work-places’. (Henderson & Cockburn, 1994; OECD, 1998; Hemmert, 1998; Michi & Sheehan, 1999; Laursen & Mahnke, 2001; Laursen, 2002; Laursen, & Foss, 2003; Terziovski & Morgan, 2004)

→ Broad socio-economic contexts where they become adopted. (Kaplinski, 1995; Legewie, et al., 2000; Sparkes & Miyake, 2000; Doeringer, et al., 2003; Terziovski & Morgan, 2004)

→ Response to competitive pressures, improve productivity, financial performance, employment. (Ichniowski, et al., 1997; Zanko, et al., 1998; OECD, 1998 & 1999; Barton & Delbridge, 2001; Bartlett, et al., 2002; Michi & Sheehan, 2003; OECD/Statistics Canada, 2003; Beret, et al., 2003; Bae & Rowley, 2004)

→ Impact on innovatory performance. (Michi & Sheehan, 1999 & 2003; Laursen & Mahnke, 2001; Laursen, 2002; Laursen & Foss, 2003; Lorenz & Wilkinson, 2003)



# Relevant HRM Practices

## Enhanced HRM practices and Firms' innovative performance

	Ichniowski et al, (1997) <sup>1/</sup>	Michi & Sheehan (1999)	Michi & Sheehan (2003)	Laursen & Mahnke (2001) <sup>2/</sup>	Laursen (2002)	Laursen & Foss (2003)
<u>Staffing practices</u>						
Strategic hiring	✓		✓			
External market*						
Internal market*						
<u>Goal-setting, performance appraisal and rewards</u>						
Goal-setting*						
Performance evaluation	✓	✓	✓	✓	✓	✓
Reward for performance	✓	✓	✓	✓	✓	✓
Leadership*						
<u>Team-based organization</u>						
Teamwork practice	✓	✓	✓	✓	✓	✓
Group Structure	✓	✓	✓	✓	✓	✓
<u>Integration to the organization</u>						
Integration			✓	✓		
Empowerment/politics				✓	✓	✓
Multiple career tracks*						
<u>Flexibility</u>						
Rotation assignments	✓	✓	✓	✓	✓	✓
Internal			✓			
external			✓			
<u>Industrial relations</u>						
Employment security	✓	✓	✓			
Communication						
manager-employee	✓	✓	✓	✓		✓
Unionization	✓	✓	✓			
<u>Training</u>						
Low	✓		✓			
High	✓		✓			
On-the-job				✓		✓
Off-the-job				✓		✓

\*Mentioned in management studies, though not formally addressed in the innovation literature; Source: Author with information obtained from the studies cited in each column heading.

# What We Have Learned

- Enhanced HRM practices better as systems. (Ichniowski, 1997; Zanko et al., 1998; Michi & Sheehan, 1999; Laursen & Foss, 2003)
- At least 4 possible clusters of dynamic HRM.
- Positive relationship between alternative characterizations of technological and organizational change. (Lorenz, 2003)
- Sectoral affiliation conditions the impact of HRM on innovation. (Laursen, 2002; Laursen & Foss, 2003)
- HRM practices condition interactions with environment.

# Some Knowledge Gaps

- Most empirical studies based on survey data or case studies. (Michi & Sheehan, 2003; Laursen & Foss, 2003; Lorenz & Wilkinson, 2003)
- Lack of detailed/comparable data across countries. (Lorenz & Wilkinson, 2003)
- Difficult to see:
  - Influence on distinct departments/people;
  - Impact on ‘creativity’, ‘creative-processes’ underpinning innovation;
  - Contribution along different stages of innovative process;
  - Objectives pursued by firms;
  - Specific impact on firms’ external interactions;
  - Characteristics of training, issues and agents involved.

# Research on Developing Countries

- Management: specific aspects of particular HRM practices. (Kaplinski, 1995; Ta-Cheng Hsiao, 1997; Zanko et al., 1998; Kim & Cha, 2000)
  - Mostly descriptive, little performance considerations. (Zanko et al., 1998)
  - Centred on dynamic South East Asian countries.
- Innovation studies: conditions and determinants diffusion of Japanese-style management practices. (Kaplinski, 1995; Cho, 2004)
- Impact on training or knowledge transfer in production. (Sparkes & Miyake, 2000; Bartlett, et al., 2002; Bae & Rowley, 2004; Okada, 2004)
- No research on HRM and innovation.

# Scope of this Research

- Consistent empirical and theoretical work on relationships HRM-innovation seems yet to be done :

→ Do firms' HRM practices contribute to enhance people's and, thereby, firms' innovation performance in developing countries?

→ Which practices matter most for innovation?

→ What is the importance of such practices for different firms in terms of sectors, technology profile and national origin?

→ What are the possible implications for the design and implementation of S&T policy in developing countries?

# A Dual Methodology: Empirics + Case Studies

- Goal: ‘sensing’ objectives, impact, instrumentation of HRM practices.
- Contrasting experiences between innovative and ‘non-innovative’ firms through detailed cross-country case studies.
- Two of the major Latin American economies: Brazil and Mexico.

# Empirical Model

- The empirical model: (Michi & Sheehan, 1999 & 2003; Laursen & Foss, 2003)
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$$p(I) = f(aX, bY)$$

Where,

$p(I)$ : probability of a firm being an innovator;

$a, b$  parameters associated to a set of control variables;

$X$  traditional determinants of innovation;

$Y$  variables representing individual and/or systems of HRM practices.

# Case Studies

- Objective: learning about nature and content; structure and organisation of innovation departments, and impact of HRM on firms' innovative performances.
- Firms included in the study:
  - Companies in the Annual National Technology Awards in Mexico and Brazil. (PNT; Prêmio-FINEP)
  - Databases from S&T authorities.
  - Contrast and validation by comparison with 'non-innovative' firms.