

Proceedings
Teaching Entrepreneurship to Engineering
Students

Engineering Conferences International

Year 2003

PhD Research in an Entrepreneurial
Environment: The Innovation
Realization Lab

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PhD Research in an Entrepreneurial Environment

THE INNOVATION REALIZATION LAB

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Created With \$2.5 Million from
the
National Science Foundation
(NSF)

- Integrative Program in Graduate Education & Research Training (IGERT)
- Support for 30 MBA and 30 PhD students over 5 years
- Collaboration of 24 faculty from Schools of Agriculture, Engineering, Management & Science

IRL is Designed To:

- Graduate Technically Proficient S&E PhDs with *Skills needed to Succeed in Innovation- Related Careers in Industry*
- Produce Thesis Research of Scientific Merit *and Market Relevance*
- Provide MBA Students with Project Management Experience *in a Technical Research Environment*

- Why IRL?

Industry Survey on PhD Graduates:

- “Good”
 - Technical skills
- “Inadequate”
 - Ability to address new problems
- “Need Improvement”
 - Management skills
 - Communication skills
 - Teamwork skills

Source:

IRL Interviews with
Industrial Leaders RE:
University Education of
Engineers and Scientists

Industry's Biggest Problems in R&D

- Managing R&D for Business Growth
- Balancing LT and ST R&D
- Integration of R&D with Business Strategy
- Making Innovation Happen
- Assessing R&D Productivity

IRL Survey > 190 Responses
(4 of 5 years) “Top 5 ‘Top 3’
Problems”

It Helps if MBAs Understand the Technology



“A year’s subscription to Fruitfly Magazine? You idiot! We only live for two weeks!”

...and Scientists Understand Business

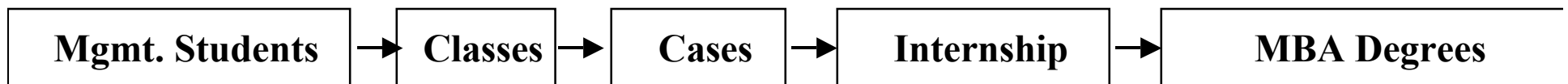
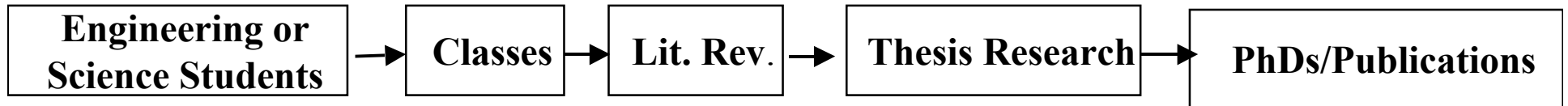
“I’m telling you –
the market’s gotta
be at least this big!”



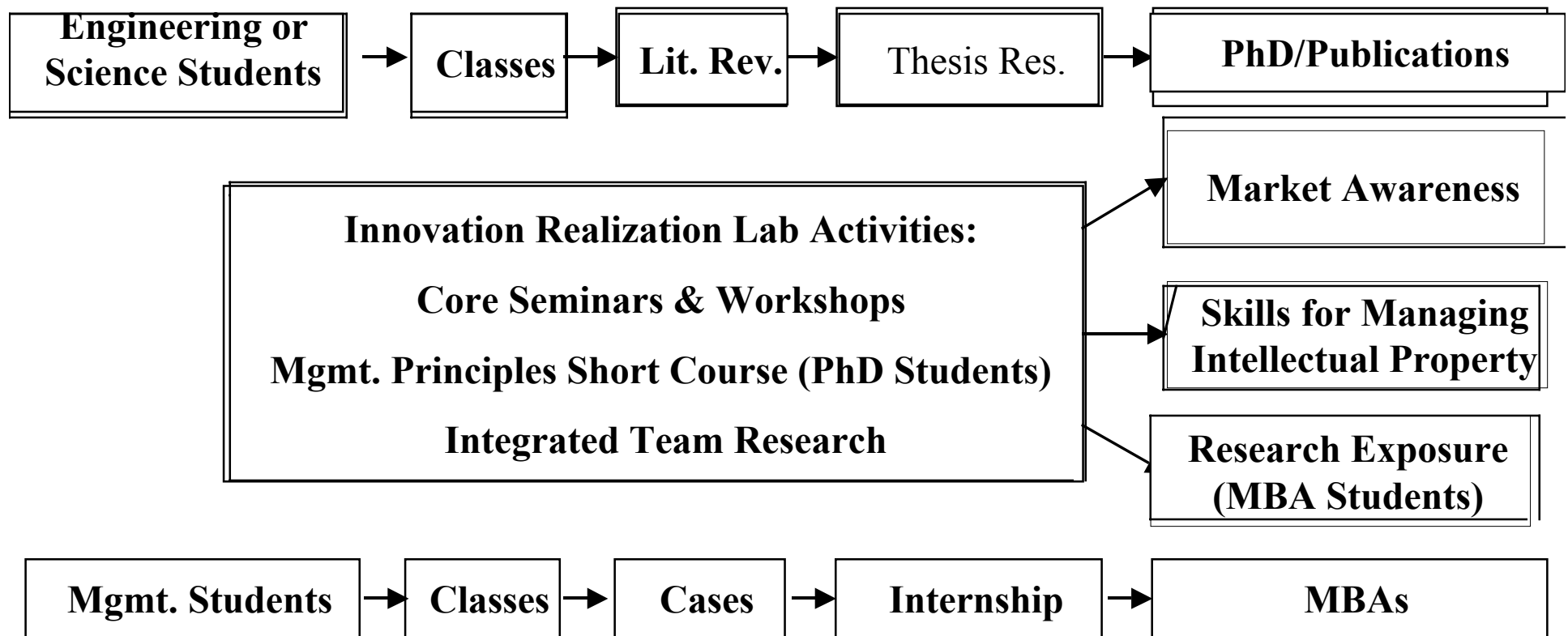
IRL Team Composition

- MBA and Agriculture, Engineering or Science PhD Students
- Resources:
 - Program Directors
 - PhD Advisors
 - Krannert Faculty in Economics, Finance, Marketing, Org. Behavior, Strategy
 - Industry Partners

Traditional MBA & PhD Experiences



The IRL Experience



Traditional PhD Research

TRADITIONAL THESIS RESEARCH

Hypothesis formation

Hypothesis testing

Prototype

SCIENCE ISSUES

Scientific merit; technical feasibility

Validation of research results

Refinement and scale-up

IRL Team Process

INTEGRATED RESEARCH

Hypothesis formation
Market forecast

Hypotheses testing
Competitive analysis

Prototype
Commercialization strategy

SCIENCE/BUSINESS ISSUES

Scientific merit; technical feasibility
Economic and social impact

Validation of research results
Risk, product and platform definition
Patent or copyright
Business creation or license
Venture capital

Refinement and scale-up
Full market analysis (e.g. pricing, cost)

What is Unique About IRL?

- PhD Exposure to Business Issues and Methods
- MBA Immersion in a Research Environment
- Market Awareness Before the Research is Done
- Breadth of Disciplines & Team Activity

Value Added

- PhDs and MBAs *With Experience & Skills to Create Economic Value From Technology*
- Thesis Research of Scientific Merit & *Market Relevance*
- Recruit and Graduate the Best & *Enable Them to Succeed in a Competitive Entrepreneurial Environment*

Current IRL Enrollment

- Total of Thirty Students
 - Fifteen PhD Fellows Representing Eight Purdue Departments from Agriculture, Engineering, and Science
 - Fifteen MBA Students

Innovation Realization Lab

QUESTIONS?



