

Proceedings
Teaching Entrepreneurship to Engineering
Students

Engineering Conferences International

Year 2003

PhD Research in an Entrepreneurial
Environment: The Innovation
Realization Lab

Warren H. Stevenson
Purdue University

Marie C. Thursby
Georgia Institute of Technology

Ronald J. Steuterman
Purdue University

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PhD Research in an Entrepreneurial Environment

THE INNOVATION REALIZATION LAB

Warren H. Stevenson
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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

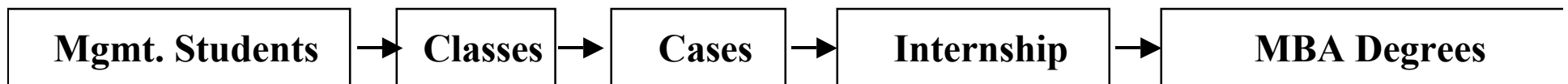
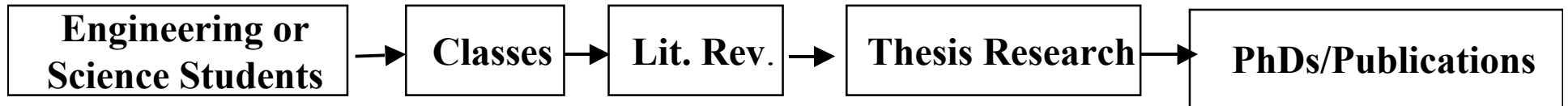
“I’m telling you –
the market’s gotta
be at least this big!”



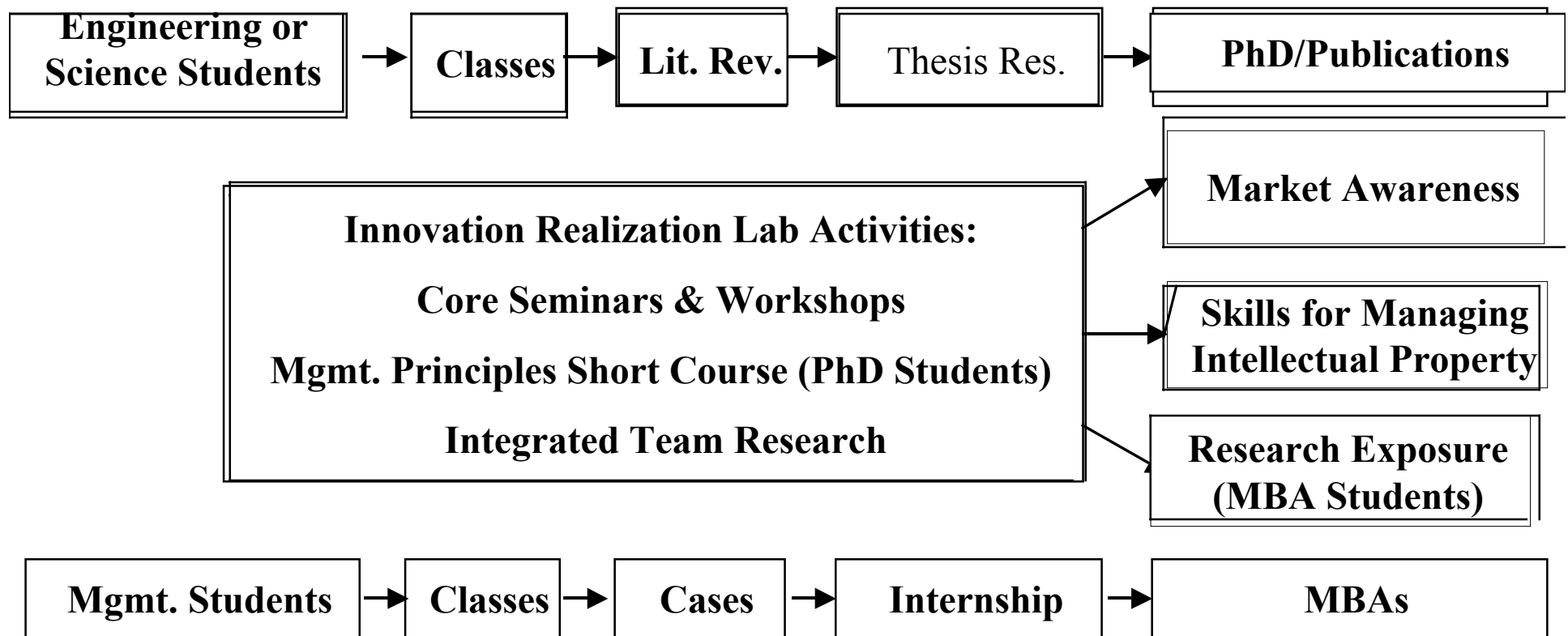
IRL Team Composition

- 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?



