Engineering Education Research as an Investment in National Competitiveness

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R&D accounts for 5 percent of real GDP growth 1959-2004 and 7 percent between 1995-2004. This ramp-up in R&D's contribution helps explain the pick-up in economic growth and productivity since 1995.
Engineering Education Research
Addresses 3 of 4 Areas Identified in
Rising Above the Gathering Storm

Recommendations in four areas to compete, prosper and be secure in a global economy:

- K-12 Education
- Higher Education
- Research
- Economic Policy
- Engineering Education
Engineering Education Research
Strengthens National Competitiveness

National Competitiveness
depends upon

Technological Innovation
depends upon

Robust Science & Engineering Research
depends upon

Superlative PreK-Gray Education
depends upon

Engineering & Science Education Research
Interactive and collaborative learning improves understanding and retention of material.

Force concept inventory reveals fundamental misunderstandings, but shows learning gains as a result of engaged instruction.

Restructured content leads to better learning of key concepts and enhanced performance in follow-on courses.

Learning cycle-based course improves understanding of biological concepts.

Source: Then, Now, and In the Next Decade, PKAL (1999)
Engineering Education Research
Examines the Entire System

What to Teach?
How to Teach?
What Tools aid Learning?
Who Teaches?
Who Learns?

Inspired by Hubka and Eder (1988)
Today's Presentations Highlight Important Findings from Recent Engineering Education Research (EER)

**WHAT TO TEACH**
EER aligns education with employer-valued knowledge and skills

**HOW TO TEACH**
EER describes how emphasis on context can attract women to engineering

**WHAT TOOLS AID LEARNING**
EER reveals that structured internships aid acquisition of innovation skills