



Integrating Practice, Education, and Research

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Abstract

For structural engineers to be leaders in helping society meet its future global challenges, our profession must respond to developments by changing more rapidly and meaningfully than we can today. Our profession should be in a constant state of advancement, creativity, and self-improvement. We must shorten the innovation cycle. Key to achieving this state is to re-examine the relationship between practice, education, and research. The three must be thoroughly integrated.

Keywords: Professional practice, education, research, change, professional development, university, research, codes, innovation, continuing education, mentoring.

1 Introduction

The world is changing at an accelerating pace. For structural engineers to be leaders in helping society meet its future global challenges our profession must respond to developments by changing more rapidly and meaningfully than we can today. Our roles and abilities will be ever evolving. We must create new materials, systems, and processes for getting things done and bring them to practice rapidly. Our profession should be in a constant state of advancement, creativity, and self-improvement. Key to achieving this state is to re-examine the relationship between practice, education, and research. The three must be thoroughly integrated.

As with many professions in science and engineering, specialization has caused practice, education, and research to fragment over the years. This paper examines the needs for integration, its challenges, and actions required to achieve it.¹

¹ While many of the concepts herein apply globally, they derive from the author's experience largely in the United States. Some ideas were informed by a workshop organized by the author and conducted at Structures Congress, April 2015, Portland, Oregon, USA.

2 Integrating Practice and Education

An oft-expressed concern is that our university programs are distanced from the practical. Our teachers must have sufficient practical experience to properly develop engineers of the future. I believe that all professors should have some practical experience. We should encourage teachers to spend sabbaticals in practice. We should expand universities' employment of Professors of Practice

Engineers need a broader foundation in areas such as communication, leadership, creativity, and collaboration. Undergraduate programs, particularly, should be overhauled for more emphasis on basic soft skills.

University advancement and reward systems must be realigned with research and educational needs. We must encourage research that is practical and results in innovations that may be adopted by industry. We must restore emphasis on educating engineers by ensuring professors are evaluated and advanced for it. My colleagues in academic leadership positions tell me that practitioners can have much more influence in this outcome with

Panelists in that workshop were: Jerome Hajjar, Northeastern University; Edward DePaloe, Severud Associates; Robert Pekelnicky, Degenkolb Engineers; and Ron Klemencic, Magnuson Klemencic Associates.