



The Law School Model ...

Structural engineering education today is a mess. The problem starts with the high school students that are traditionally attracted to the profession. Almost without exception, they are the ones that like math and science, and dislike civics and literature. Many, if not most, are more comfortable interacting with or through their computers and mobile devices than they are interacting in person with other people. This left-brained, somewhat introverted group is the raw material that feeds the pipeline year after year. Thus, the stereotype begins early.

Lacking better options, most structural engineering students initially pursue a Bachelor of Science in Civil Engineering, or BSCE, degree. The requirements to earn a BSCE degree have dropped precipitously, from nearly 150 hours in 1960 to an average of about 125 hours today. Over this period, civil engineering has grown into a very broad field, with structural engineering representing one of perhaps a dozen areas of specialization. Civil engineering departments understandably strive to expose their undergraduate students to all areas of civil engineering. The result is a BSCE degree that now amounts to little more than an introduction to civil engineering. It does not provide much breadth of knowledge beyond civil engineering. Even worse, it utterly fails to provide anything close to the depth of knowledge necessary to start a career in a specialty such as structural engineering.

For many years, structural engineering students have been urged to pursue a graduate degree. The Master of Science in Civil Engineering, or MSCE, degree has been the “sweet spot” for entering the structural engineering profession for at least the past three decades. A MSCE degree typically requires 30 to 36 hours, and the majority of those hours are spent in a single specialty such as structural engineering. Consequently, the MSCE degree typically provides the depth of knowledge needed to start a career in structural engineering. However, it provides little or no additional breadth of knowledge beyond that acquired as an undergraduate. This is truly unfortunate. Without a breadth of knowledge, and a bit of right-brained thinking, young structural engineers are unlikely to emerge as future leaders.

Most structural engineers spend their time designing beams, columns, frames, and the like. They do not lead their project teams, their firms, their profession, or society. Preferring to avoid risk, they seldom innovate. Instead, they believe that good design work is their highest calling and they derive considerable satisfaction when their designs become reality. In 20 years, the majority of these engineers will be just as obsolete as telephone operators, bank tellers, and travel agents are today. Most of their work will have been replaced by automation, and much of the remainder will have been sent overseas to be done at lower cost. Without substantial change, the profession of structural engineering might shrink by as much 80%. Clearly, change is needed.

A committee of structural engineering leaders recently completed a two-year study on the future of their profession. They concluded that there are two keys to success. Future structural engineers must be leaders and innovators. Today, of course, most structural engineers are neither. Bridging the gap will take time and the process must start with education. A much more diverse group of high school students must be attracted to the profession and the notion of professional education at the undergraduate level must finally be abandoned. How can this be achieved?

The aforementioned committee has developed a conceptual plan, affectionately dubbed “The Law School Model.” Under this plan, students will be encouraged to seek an undergraduate degree in any field that interests them. Beyond good grades, the only prerequisites will be math, physics, and chemistry. A degree in biology, political science, or psychology will be viewed just as highly as a degree in engineering. A year of study abroad will be viewed as a plus. After graduation, those students pursuing a career in structural engineering will take entrance exams for their preferred structural engineering schools. Those schools will be similar to law schools in many respects. After two or three years of focused structural engineering study, their graduates will receive professional structural engineering degrees. If the plan works as intended, those graduates will be a diverse group of well-rounded individuals with the skills and attitudes necessary to succeed at all levels. Time will tell.