

BIRTH OF A NEW DISCIPLINE

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In our global society with its increasing technological demands and opportunities, engineering education plays an undeniably significant role. However, engineering education has not kept up with the sweeping changes in engineering practices and, instead, continues to prepare students to be engineers for a world one or two generations past. This raises a question: Does the engineering education community have the capacity to embrace change, and transform itself to position the whole profession well for the next 50 years?

An international awareness regarding engineering education reform is driving the need to establish the field of engineering education as a scholarly endeavor and as a serious discipline. The challenge facing engineering education cannot be met by simply modifying an outmoded curriculum. We need fundamental research that also transforms learning and teaching. “No one would think of getting to the moon or wiping out a disease without research. Likewise, one cannot expect reform efforts in education to have significant effects without research-based knowledge to guide them.”(NRC, 2002). While recent major initiatives are indeed having a discernable impact, engineering education stands now at a crossroad. Sustainable reform will require a long-term, calculated, research-based investment that addresses fundamental issues of engineering education.

Challenges are substantial but not insurmountable. There is a lack of solid research base and culture, partly because there has been too much emphasis on reform. This has resulted in a lack of significant body of knowledge in engineering education. Most of the resources have also been devoted to program development, implementation, and adaptation, without a research base to drive the practice. There is also a lack of appropriate research and academic infrastructure and capacity. In addition, there is no career path and a suitable reward structure for engineers and professionals in this field.

The recently created Department of Engineering Education at Purdue University owes its existence to the premise that engineering education is an important and promising field of scholarly activity and that we need fundamental knowledge to undergird transformational decisions. Our goal is to impact K-12 and to develop a new cadre of diverse faculty and education leaders through our innovative graduate degree programs (MS and PhD) focused on cutting-edge engineering educational research.

The stage has been set to substantively elevate the status of educational research in faculty performance reviews, and to increase collaborations between engineering faculty and faculty in other areas including education, psychology, cognition and neurosciences, among others. Engineering Education faculty will be evaluated and rewarded by the same structure and measures as other engineering faculty. Research in engineering education will be as valued as technical research for promotion and tenure considerations.

Open dialogue and support within the engineering community and beyond will be critical for the success of such endeavor. A new opportunity is at hand for engineering education to be more broadly recognized as a scholarly field of activity and a serious discipline. What challenge could be greater or more rewarding than to successfully direct how we educate and prepare our future engineering leaders?