

# When Do Engineering Students Learn?

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This paper explores the dilemma faced by all major engineering institutions regarding how to best prepare our students to become practicing engineers capable of addressing the demands and future needs of society. For, today's problems are already being addressed by yesterday's engineering students. In particular, this paper presents the author's point of view regarding the difference between teaching and education and their role in the formation of successful engineers.

Of great importance is also the recognition by engineering institutions of their responsibilities and contributions to the formation of potential practicing engineers. For it is not the role of the engineering institutions to produce practicing engineers but to produce well equipped young minds with the needed fundamental tools and motivation to grow into practicing and productive engineers capable of recognizing and solving the future needs of society. Thus, there lies the challenge of any engineering institution of first, recognizing what would be the needs and problems of society in the future, and secondly, teaching the basic fundamental tools needed to solve those problems. Engineering institutions must realize that their customer is not the student but society; and, the students are merely the vehicle through which engineering institutions meet their social responsibility.

In this dilemma between teaching and education, one must wonder what's the role of the professor at the front of every classroom, laboratory, and counseling session. To the engineering institution, the professor represents the means and methods but for the student, the professor is the role model of what they aspire to be. The professor has the greatest responsibility of showing by example what a life fulfilling experience it is to be a practicing engineer.

Partnering between engineering institutions and engineering practice is the keystone for

engineering teaching institutions providing an engineering education. The difference between teaching and education lies in not only knowing what but in knowing what, when, and why. Without this partnering, engineering institutions will be limited to developing problem recognizing minds and not problem solving minds. At school, students are taught that all problems are black and white; however, engineering practice educates young minds to find the solutions in the gray area in-between.