PART VI.

COMMENTARY ON PAPERS #23 TO #26:
Part of a famous six-part series (plus introduction) on the future of engineering education

WE HAVE INCLUDED THE FOUR PARTS OF GREATEST INTEREST TO NEW FACULTY.

This series by Rich Felder, Armand Rugarcia, Jim Stice, and Don Woods is close to a textbook on teaching engineering. Although it does not cover all aspects of teaching engineering, the series could be used to teach an extended workshop for new or continuing faculty.

Part 1 of the series (paper #23) boldly makes predictions about the 21st Century. Since it has been 14 years since these predictions were published, it is interesting to see how accurate they were. The following seven features were predicted to be a challenge for engineers: proliferating information, multi-disciplinary engineering practice, global markets, endangered environment, emerging social responsibility, participatory corporate structures, and rapid change. These predictions have proven to be quite accurate. The paper notes signs of change in engineering education, and despite recognizing many of the obstacles to change, states that “The presence of hard evidence to support claims of improvement in learning should make it easier to disseminate educational reforms to the skeptical mainstream engineering professoriate.”

Part 2 of the series (paper #24) discusses teaching methods that lead to increased student learning: writing learning objectives, showing real-world relevance of course material, teaching inductively, balancing concrete and abstract information, using active learning methods in class and cooperative learning in and out of class, giving fair but challenging tests, and conveying a sense of caring about students’ learning. All of these methods can be incorporated in any course. Part 3 (paper #25) explores the development of student skills in the areas of problem solving, writing, teamwork, self-assessment, lifelong learning, and change management. Development of these skills is easier to foster in a studio, workshop, or problem-based learning environment than in lecture.

Part 5 (paper #26) covers assessment of student learning, student ratings, and other forms of evaluation of teaching and conducting and assessing engineering education scholarship. The sections on assessing student learning and student ratings of instruction will probably be of most interest to new faculty.

Interested readers may also want to read the series introduction, part 4 on learning how to teach, and part 6 on how to make reform happen.

