PART III.
COMMENTARY ON PAPERS #12 TO #14:
Specific teaching methods for special cases

The prolific Rich Felder in paper #12 shows that requiring students to write their own quiz, test, or homework problem plus work out a detailed solution to their problem is an excellent method to help them integrate course material. The students can be encouraged to be creative by announcing that their problem must be creative to earn a high grade. Both of the editors of this collection have used this method successfully with students ranging from sophomores through graduate students.

Since writing is crucial for practicing engineers (a ubiquitous comment from industrial advisory boards), teaching students to write is an important goal of engineering curricula. We selected one paper from the large number of papers published by CEE on improving writing. John Friedly (paper #13) discusses 10 simple areas associated with written communication that, if considered, will improve the quality of students’ written products.

For paper #14 Don Woods, who was the chemical engineering expert on problem solving and teaching students to solve problems, assembled a large group of his students who wrote the paper as a team. This paper considers five aspects of problem solving: the type of problem to be solved, necessary prerequisite knowledge and skills, strategies, heuristics, and the elements used while applying the strategies. Three papers in other parts of this collection also discuss problem solving: Paper #10 (Lamm and Brewer, 2014), paper #18 (Woods, et al., 2013), and paper #25 (Woods, et al., 2000).

Readers interested in more on problem solving will probably find that the Don Woods paper listed below is useful. This paper thoroughly reviews problem solving strategies and recommends use of a particular evidence-based strategy. The references provided in this work are a pathway into the research literature on this topic.