

This one-page column will present practical teaching tips in sufficient detail that ChE educators can adopt the tip. The focus should be on the teaching method, not content. With no tables or figures the column should be approximately 450 words. If graphics are included, the length needs to be reduced. Tips that are too long will be edited to fit on one page. Please submit a Word file to Phil Wankat <wankat@ecn.purdue.edu>, subject: CEE Teaching Tip.

APPROACH TEACHING USING RESEARCH SKILLS: A GUIDE FOR NEW FACULTY

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New faculty can take the mindset they already have developed for doing technical research and adapt it for teaching.

Scenario: You've trained for years in your technical area and are well prepared to do technical research. During your interview for a tenure-track faculty position, you have an interview with an associate dean—me. I've read your impressive 30-page research plan as well as your one-page teaching plan, half of which lists the courses you can teach. After I ask and you explain how you developed your research plan, I ask how you developed your teaching plan. Your answer is much shorter and indicates you are not well-informed. Then, I walk over to my bookshelf, bring back various journals and classic books in engineering education, and ask "why haven't you included any references from these journals or from these books for your teaching plan in the way you have for your research plan? This is the literature for this field." You stammer, thinking that this is a reasonable question and wonder why you have not even thought to do this. But then I explain that your response is the norm and this creates, hopefully, a teachable moment. You eagerly listen and write things down on a notepad.

Chances are you aren't nearly as well prepared for an assistant professor's teaching responsibilities as you are for research. Perhaps you were a teaching assistant and gave a lecture or two for your Ph.D. or postdoc advisors. But you do have something very useful on your side: you already have experience tackling new areas since you've been developing this skill as a graduate student and postdoc. Put this skill set to use for your teaching responsibilities by couching your approach to teaching as you would your technical research.

The following path is fairly typical for conducting technical research once you have an idea or area of interest.

1. Review the literature.
2. Join an organization and attend a conference to learn more about the state-of-the-art.
3. Discuss your research idea with colleagues.
4. Attend a workshop to refine your knowledge.
5. Do preliminary research for proof of concept.
6. Develop a research plan and submit a grant proposal.
7. Perform the research, evaluate your results, and fine-tune the methods.
8. Publish and present your results.

With the changes noted below, a similar path can be followed in doing scholarly teaching and classroom research.

1. Review the chemical engineering education literature (e.g., Chemical Engineering Education and ASEE Conference Proceedings) and pertinent textbooks.
2. Join an organization (e.g., AIChE and/or ASEE) and attend a conference.
3. Discuss teaching methods for this course with colleagues who have taught the course before.
4. Attend a workshop [e.g., the ASEE National Effective Teaching Institute (NETI)] to learn teaching methods that are more effective than lecture.
5. Teach the course the first time using teaching methods you are fairly familiar with, perhaps lecture interspersed with active learning methods.
6. Develop ideas to improve the course and discuss with a mentor or colleague.
7. Try your ideas in class, assess and evaluate your results, and modify as needed.

Although most engineering professors stop the process at this point, consider the next step.

8. Publish in the chemical engineering education literature and/or present your results at a conference.

Remember, you have well-honed skills in tackling new areas from your research. Put those to use to get off to a fast start in your teaching responsibilities as well. □