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 500 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.

SKITS, STOCKINGS, AND SENIORITIS ALE: CREATIVE CHEMICAL ENGINEERS

Lisa G. Bullard
North Carolina State University

I teach almost all of our students in both their first and last chemical engineering courses (Material and Energy Balances and Senior Design II). Each semester I offer them an opportunity to be creative and to reflect on their experience in these courses:

> *You may earn up to 10 points of extra credit on your final homework assignment by submitting a creative expression of your experience in this class. This might include a poem, video, craft, song, puzzle, artwork—the sky's the limit! Your work must be original, and your submission must be in good taste.*

Submissions range from simple haikus to more elaborate written works such as "All I Need To Know I Learned in CHE 205," "If Hansel and Gretel Were Chemical Engineers," and "Murder at Miskatonic—Passion, Intrigue, and Material Balances: A Play in Two Acts" (which the student later published).[1] Other students have submitted music videos with words set to songs such as "I Will Survive" or the theme to *Gilligan's Island*; craft items (jewelry, crocheted scarves featuring thermodynamic symbols, metalwork, woodwork); CHE-themed bumper stickers; original T-shirts; a bottle of homebrewed "Senioritis Ale" with a creative label; a piñata decorated to look like their Felder and Rousseau textbook, *Elementary Principles for Chemical Processes*; a decorated Christmas stocking containing slips of paper on which each student wrote their favorite memory of the material and energy balances class; and artwork ranging from cartoons to collages. Edible submissions such as cookies decorated with key equations or thermodynamic symbols are always well received. Examples of student submissions can be found at <http://www.che.ncsu.edu/bullard//Creative.htm>.

When one student group in Senior Design II assembled a "senior slide show," which was also shown at the graduating senior banquet, a new tradition was born. Now I specifically request that a group of students volunteer to take on this project each year. Some of the students voluntarily do the same sort of thing in other courses. Two students who did a music video in the stoichiometry course did sequels in process simulation, thermodynamics, and senior design that are enshrined on YouTube (<http://www.youtube.com/watch?v=8OZhEclvpFA>). Another student who submitted a personal course journal in the sophomore course continued the journal through her senior year, documenting her entire experience in chemical engineering. For examples of other ways to incorporate creativity, Felder offers ideas for integrating creativity exercises in courses throughout the curriculum,[2] and Lane shares (and performs) songs that reinforce course concepts.[3]

This assignment encourages students to reflect on their experience in the course and to attempt to express that experience in a tangible way. It provides an outlet for those students with a creative bent to express their individuality, hopefully dispelling the stereotype that engineers aren't creative. Finally, sharing the extra-credit submissions on the last day of class ends the semester on a positive and often humorous note and serves to create an indelible memory for both the students and the instructor.

REFERENCES

1 Vestal, J.M., "Murder at Miskatonic—Passion, Intrigue, and Material Balances: A Play in Two Acts," *Chem. Eng. Ed.*, **42**(2), 62-68 (2008)
2 Felder, R.M., "On Creating Creative Engineers," *Eng. Ed.*, **77**(4), 222-227 (1987), < http://www.ncsu.edu/felder-public/Papers/Creative_Engineers.pdf>
3 Lane, A.M., "Teaching Tips: Celebrating ChE in Song," *Chem. Eng. Ed.*, **42**(1), 52 (2008) ❐