comes commercially available, more interactive features can be added (for example, a method for self-grading). Another alternative to the interactive mode is to include a short test as part of the software, with some sort of point system to evaluate the answers. This, however, would eliminate the direct interaction and make the presence of the professor less relevant. I still believe that direct interaction is the best experiential learning.

The first time I tried the program the class had fifty-five students, and every class was conducted in the computer lab. I was not able to cover all the material listed in Table 1 (in particular, the applications of macroscopic balances). Some of these examples are revisited in our Design I course, so I covered only the fundamentals. The second time around, the new class of seventy-two students could not be accommodated in a single session in the computer lab, so I divided the class into two sections. Each section attended the computer lab once a week for 75 minutes in addition to a 75-minute lecture for the entire class in a classroom where there was a podium computer to display my lectures. The interaction here was the traditional question-and-answer format. Several of the lessons which had been worked out previously during the tutorial were assigned as homework problems. This required that I volunteer 75 minutes of my time to teach the course.

Even though it takes more time to cover the material when using interactive software, it was an interesting experience. The interactive features motivated the class and provided an incentive for the students to get involved. Above all, it made teaching fun for me, and the majority of the class enjoyed it as well. In the computer lab I found I had to alert the students to the fact that class was over, instead of listening to the impatient rattle I would usually hear as the period drew to a close.

The first time the course was presented, most teaching evaluations were very positive, but there was a small group (about 4%) that did not like the software and strongly voiced their preference for the regular lecture. I suspect that for those unfamiliar with computers, the new format presented an extra burden of gaining computer literacy and this produced the negative reaction. The second time around when I combined the tutorial with the regular lectures in a 50-50 mix, there were no negative responses as to the use of computers in the classroom. This time I also posted the lectures ahead of time so the students would have copies available during class. I am still struggling with the question of whether or not to give students access to the solutions or let the class work them out. While computers can be wonderful tools when used conscientiously, they can also be expeditious copying machines, which defeats the purpose of experiential learning.

The method is not limited to chemical engineering but can also be applied to many different disciplines. During a weekend when the parents visited the university, I hosted an open house for them where I set up a riddle for them to solve. Everybody seems to have enjoyed the experience—even those who did not get the right answer. I also used videos to illustrate physical phenomena, such as boundary layer flow. This gave the students a visual experience that equations do not impart.

The method is still limited to situations where there are classrooms with networked computers. Undoubtedly, there will be more of these in the future, and software such as described in this paper will become commonplace. I envision a future when computers will be an active part of our teaching technology. We should continue to introduce the latest multimedia technology into the classroom to improve what I believe are less-than-effective teaching methods.

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