

Response to Keller Plan Questions

I am pleased to provide some information in response to the questions from Norman Cameron about my experiences with the Keller Plan as described in the January issue.

The teaching lab I described is open about 20 hours each week. During each hour there are between one and three TAs on duty. The lab is drop-in, so the number of students fluctuates greatly. I have not collected statistics, but typically there are between three and ten students there, either working by themselves, or discussing a problem with a TA, or, as Cameron suggests, working in a spontaneously formed group which might or might not include a TA. To some degree the same students come at the same times to work with the same TAs, but in most cases this is due to the students' and TAs' weekly schedules, although one of the benefits of the lab we have is that students can choose the TA with whom they want to work, and many explicitly say that they have found one or two TAs with whom they especially like to work.

The security of Elke Weber's superb quizzes has always been a big concern of mine. I sometimes call them the "million-dollar quizzes"; perhaps it wouldn't take a million dollars to create a duplicate set, but I'm sure it would be at least \$100,000. About 15 years ago, I decided to create a new module and a short associated quiz, following Elke Weber's quiz design. I found it an extremely challenging task, taking far longer than I anticipated. And Weber created about 20 such quizzes, each full-length (not short, like mine), with all their parallel forms!

The difficulty is that each wrong answer is to be based on a particular error, as briefly described in the original paper and, more extensively, in Elke Weber's study guide (pp. 1 to 6). First, you have to think of various ways students can go wrong in answering a question. One might be guided by a bank of open-ended quiz questions already answered by students. (Weber had such a bank when she developed her quizzes.) Second, you have to be sure that the wrong answers are all different! It was this latter step I found especially challenging. If two answers are "close", then the question is unsatisfactory, since students often round results inappropriately early and may land on the "other" answer. This is particularly problematic if one of the wrong answers is close to the correct answer.

Returning to the security issue. The quizzes are always kept in locked cabinets. I have done the sorting of quizzes myself, not trusting it to others who might leave them sitting around on their desks. There are detailed instructions to the TAs in the TA Handbook about how to ensure that students log in when they receive a quiz so we have an accurate record of who received a quiz and therefore what quizzes should have been returned. Occasionally a quiz appeared to be missing; I always followed this up with a call to the student and, invariably, the mishap was explained. On two occasions over the 25 years there was a more serious breach which was handled through the university's procedures for academic dishonesty; severe penalties were applied. I believe that the quizzes have remained secure. There are aspects of the security that I haven't explained here (such as how many forms there are), but I am now less reluctant to discuss them, as I am in my last year of teaching.

References

Weber, E. U. (1983). *Study guide for principles of statistics*. New York: Wiley. Reprinted (1989) Malabar, FL: Krieger.