Teaching Tips for TAs: 10 Suggestions for Teaching Problem Solving

1. "The worst thing that can happen is to go along through a full hour without any questions. That might mean two things: a very remote possibility that you are extremely clear, but more often than not that you are not clear at all." --Dr. Umran Inan

2. Try beginning each segment of a class by setting up a problem and explaining why it is interesting and important.

3. Rather than asking students to memorize a formula, teach them how to derive the formula and identify its parts.

4. Try the step by step approach to solve problems. Ask small questions along the way so that students can see how the solution is being calculated and can confront similar questions with the same strategy.

5. Encourage students to imagine ways of solving the problem before you begin to work the solution together. This takes advantage of the skills the students already have and encourages them to actively extend their knowledge.

6. When you call on students, try asking them to state a proposed method for solving the problem rather than asking them for the solution to a problem. For example, ask "how should I begin to work on this problem?" instead of "what is the answer to this problem?"

7. Encourage questions from the class and then avoid answering them directly. Make sure everyone hears and understands the question and then start working on an answer as a group.

8. If you maintain a high degree of interaction with the audience throughout the class, they may be more willing to participate and ask questions. The earlier in the class the students are encouraged to talk, the more likely it is that they will contribute for the rest of the class session.

9. Try solving the problem in two different ways. This gives students a sense of how best to approach a problem, and it may prevent mistakes. This technique also holds the students' attention because they will want to see if the answer is the same in both cases.

10. To help the students to learn to formulate problems as well as to find answers to problems, present students with situations or design problems and encourage them to develop questions for themselves. This enables students to see how work is done at higher levels in their discipline.

11. Before moving on to the new concept, try asking students specific questions about a representative problem to test for learning. Students will often avoid responding to general questions such as "Does everyone understand?" A more specific question will help you to determine how well the audience is working with the material.

* This handout adapted from information in Teaching at Stanford: An Introductory Handbook for Faculty, Academic Staff/Teaching, and Teaching Assistants, 1989. Adaptation by Nancy Plooster, TA Development Program; University of California, Santa Barbara, 1997

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