

Title: Documented Problem Solutions

Purpose:

Although the title suggests this technique is for math and science courses, humanities, social science, art, and English faculty have used it equally effectively. The purpose is to have students become aware of how they arrived at the answer, not just get the correct answer. If this is done before tests, it often helps students achieve greater success on tests and in the course.

Descriptive Examples:

For example, in having students learn about subordinate clauses, English instructors provided students with complex sentences. On a page divided into two parts, they asked students on the left hand side of the page to identify in each sentence whether the subordinate clause was an adjective, adverb, or noun clause. On the right hand side of the page, they asked students to explain how they arrived at that answer by indicating 1) the function of the subordinate clause in the sentence and 2) the type of word that introduced the clause.

Math instructors have done something quite similar. For example, in solving quadratic equations, math instructors have requested that students document and explain each step in solving one or more equations.

Using the resulting data:

Students who do well in documenting their steps can lead small groups or the class, explaining their solution processes. Or the instructor can use one of the successful documented problem solutions as an illustration in class. The instructor may also realize that more time needs to be spent in clarifying certain steps in the solution or that students need more practice in documenting their thinking process more precisely.

Strengths:

By asking students to explicitly identify each step in their thinking/solution process, this CAT encourages the development of students' metacognition skills in the discipline and allows the instructor to become aware of the students' thinking processes.

Weaknesses:

Many students have little experience in explaining how they solve problems; thus, some students may find this difficult at first. However, periodic practice will enhance students' critical thinking skills. This assessment can be time-consuming for both faculty and students, so the instructor may want to limit the number of problems and provide both easy and more challenging problems to solve.

Adapted by Professor Joan Naake from *Classroom Assessment Techniques: A Handbook for College Teachers* by Thomas Angelo and Patricia Cross. 2nd edition. San Francisco: Jossey-Bass Publishers, 1993.

