

Towards achieving the Standards

Report Card:

How One Textbook Series "Meets" the Technology Standards

Taken from the *Teaching Standards*: "Standard 4 - The teacher should use a variety of tools to enhance discourse." (These tools include computers and calculators.) From the *Professional Development of Teachers Standards* also comes Standard 4 which says that teachers should use good pedagogy.

Many textbooks have responded to the call of the Standards by including examples from BASIC and Logo to enhance the learning of various topics. Here is an example of a problem taken from the University of Chicago's School Mathematics Project's *Algebra* text:

Problem: Use a computer to evaluate $3(4x-5) + y$ when $x = 3.1$ and $y = 0.6$.

Solution: Here is a computer program written in BASIC to evaluate the expression given.

```
10 PRINT "ANSWER TO EXAMPLE 4"
20 LET X = 3.1
30 LET Y = 0.6
40 PRINT 3 * (4 * X - 5) + Y
50 END
```

Run the program. The computer should print:

```
ANSWER TO EXAMPLE 4
22.8
```

There were many other examples similar to this one scattered throughout the text. So can we say that this textbook helps the teacher meet the teaching standards involving discourse and pedagogy through the use of computers?

CLIME editorial reaction: For the computer literate teacher (who is familiar with BASIC) this problem might be a springboard for an interesting lesson or lessons which might include a trip to the computer lab for the students. Unfortunately, most teachers are not familiar with programming languages and probably would consider this example a "frill" and skip it. Even if the teacher

were adventuresome and had the students do these problems, the chances are good that the students probably would not find them very enlightening.

Overall, we were disappointed by the programming examples that were used, because we felt they did not capture the spirit of how programming can illuminate mathematical ideas in an interesting way. This is particularly significant, because most teachers look to their textbooks to guide their teaching and learning. Our contention is that if the examples were done in a more interesting way, then the teachers would be more likely to present the ideas in a more engaging way. What is needed is to make the programming an *integral part of the lesson*. Not only is the presentation not interesting, but it is also organized in a way that makes it convenient for teachers to skip the problems. If the publishers are serious about supporting the Standards they must understand better how to write their texts in a way that encourages more active teaching and learning.

An Alternative

How might have UCSMP taken advantage of computer programming to foster more student engagement? In the first chapter there is a section on formulas. The authors begin the section with a potentially interesting, real world problem about estimating how many cars there are on the road during rush hour, but the book trivializes the

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this scripting facility editable; if and when this happens, the user will have a way of "programming" Sketchpad symbolically.

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