

HOW THE COMPUTER WILL IMPROVE YOUR TEACHING IN THE SECONDARY MATHEMATICS CLASSROOM

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In teaching, do you want to be more concerned with the rote manipulations of symbols or with the development and understanding of concepts? Using a computer as a teaching tool can help to develop concepts in our students. Computers have improved my approach to teaching mathematics. When my students were asked if they found the computer to be valuable in the classroom, some said, ". . . it helps explain the unexplainable"; or ". . . it keeps kids interested"; or ". . . it saves class time and it is clear and easy to see"; or ". . . it provides a new, interesting method to learn."

The Computer as a New Avenue of Learning

Since students are not all exemplary, new and different approaches to teaching are needed in order to reach as many students as possible. The computer will not replace the teacher, but it will provide the teacher with an opportunity to present material in another way. The computer provides a new avenue of learning, which many students find to be most interesting.

Ways to Use the Computer

The following is a list of some of the ways in which the computer can be used in the teaching process:

- * * to perform repetitive numerical computations
 - division algorithm to check for primes
 - Newton's method for finding roots
- * * to test validity of mathematical hypotheses
 - calculate the value of "e" by the definition,

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n} \right)^n = e$$

(most students reason a different response)

- test student-derived formulas by using numerous examples

- * * to analyze data collected in projects
 - do statistical calculations
 - use least squares algorithm to find equations to fit data collected
- * * to investigate real-world problems
 - work with paths of projectiles
 - do business or economic applications
- * * to graphically present concepts
 - find the intersection of systems of equations
 - show fractional parts
 - find the area under a curve by summing rectangles and trapezoids under the curve
 - visualize the velocity of a point as it moves across a screen

I have listed a few ways that the computer can be used to enhance the learning of mathematical concepts. There are numerous other ways to use the computer

Classroom Management

The computer need not be used during an entire class period. Perhaps only an average of ten minutes needs to be given to the computer during one class period. The amount of time depends on the topic, the teacher, the availability of the computer, etc. The computer may be used as a means of checking homework at the beginning of a class, or as a way to introduce a lesson, or as a way to reinforce a concept. The computer is as flexible as the teacher. It is the teacher who must decide when it would be appropriate to use the computer to enhance the lesson.

In my classroom, the computer is used mainly as a demonstration tool for the entire class. After the demonstration is begun, one or two students usually continue to manage the computer under the teacher's direction. This technique allows time to use the chalkboard and the overhead projector more advantageously. Different stations can be set up in the classroom, where the computer provides a vehicle to allow an individual or small group of students to use problem solving software. Other stations could be the chalkboard, a manipulatives table, or a problem solving

station. Another option is to separate the entire class into two teams for some math competition.

Problems?

There are some problems that may arise when a computer is used in the classroom. It is possible that the computer malfunctions, the disk is misplaced, or the information erased. Perhaps there is an insufficient number of computers for the department, or more than one teacher needs the computer at the same time. Even though potential problems exist, the computer is definitely a worthwhile tool.

Student Responses

At the end of the school year I had my students evaluate the worth of using a computer in the classroom. When I asked my students if I should continue to use the computer, the response was overwhelmingly positive. The students rated the worth of the computer as a tool for learning very high. Their responses reinforced my belief that the computer can be a beneficial aid to learning.

The computer offered a new approach to studying mathematics, helped some students to understand the concepts more clearly, offered a visual response to some questions, offered new motivation to some of my students, and reinforced concepts previously taught. Whenever I would see a certain gleam in a student's eyes, a nod of approval, or an occasional "wow" stated, then I knew that using the computer as a tool in my classroom was very worthwhile.

Conclusion

The use of the computer has greatly changed my teaching techniques and the students encourage me to continue its use. I believe that my students have gained a better understanding of mathematical concepts by using the computer in the classroom. Hopefully, the computer will provide an interesting tool for learning in your class.