

Profiles

These columns present summaries of members' activities, experience, and opinions. All members are encouraged to submit such profiles, long or short, to the Newsletter.

*From Richard Binswanger
Agnes Irwin School
PO Box 407, Rosemont, PA 19010*

I am the computer coordinator at an independent school for girls, grades K-12, near Philadelphia. Our school has worked for more than three years to integrate Logo into our mathematics curriculum. We have at different times been encouraged and disappointed, but the net has made me more than ever convinced that Logo is an outstanding tool for helping students discover mathematical principles, and that the potential remains largely untapped.

Our mathematics enhancement work with Logo takes place almost entirely in laboratory sessions, and is conducted in accord with two basic principles. Firstly, the purpose of the laboratory periods is to help students learn specific concepts within the mathematics curriculum. Concepts in Logo and computer science are treated as secondary, and are simply a means to an end.

Secondly, the purpose of using computers is to allow students to experience the discovery of concepts on their own, as opposed to having them explained in traditional didactic fashion. Team teaching has been our most effective way to run the sessions. My presence in the classroom with the mathematics teachers has meant that teacher training is a parallel outcome. Initially, we would agree on a topic of study, and I would develop and present the lesson almost entirely on my own. This arrangement left teachers free to observe both the lesson and the students. Eventually we came to share much more of the responsibility, and some teachers were able to construct lessons on their own.

Scheduling conflicts have often forced these math/lab lessons into

a once a week format. It is clear, however, that topics can be pursued to a much more natural conclusion, and that teaching has proven far more effective, when consecutive days are set aside. Important tangential ideas, which are constantly popping up, can be explored when there is more time.

Sometimes we find that during a laboratory session we may not use the computers much at all, preferring alternative methods such as planning with paper and pencil, or "acting out". It took some time to allow ourselves the flexibility of not feeling obliged to use the computers, but it has paid dividends.

Stressing the mathematics over the Logo programming has resulted in the students writing almost no Logo procedures, and staying mostly in immediate mode using procedural tools I have developed. These tools can, however, be a mixed blessing. They can be easily customized and refined with experience, but they can also be overly automated to the extent that the student may be able to sit back and watch passively. If a tool procedure does too much for a student, little learning takes place. Thus our Logo procedures and functions are designed to perform specific tasks. As with any tool, the final product reflects the ability and effort of the craftsman. This is true for both teacher and students. The enthusiasm a student can generate, the invisible structure she can impose, her ability to build upon her own ideas and mistakes, are far more critical than how well the procedures are written.

To this end, we have sought to ask more open-ended and probing questions. We pick problems with many answers, such as "Draw a rectangle with perimeter 100."; or ones that look at old ideas in new ways, such as, "Find three equations of lines that pass through (4, 5), or that extend the realm of a student's thinking, such as, "If we know the properties of a parallelogram, what are the properties of a shape we can define as a hexallelogram?"

Our school has used Logo in

mathematics classes from 2nd through 12th grades, in lessons dealing with addition through integration. We are learning and are encouraged. We are most willing to share our work, and have found that the insights of expert and novice alike can be valuable and insightful. Our journey continues. ◊

*From Reinhold Wappler
New Canaan Country School
Box 997, New Canaan CT 19010*

I was teaching away in my daily math classes when it occurred to me I was talking too much, and the kids too little. Furthermore, lots of class time was spent in wasteful ways, such as collecting homework, handing back homework, giving out assignments, going over problems that only one kid had found difficult the previous evening, and teaching (me talking) the day's lesson. All this left little time to enhance math with Logo, or to practice estimating, or even enjoy the subject.

After three years teaching Logo customs and traditions in the lower school, all this didn't make much sense. I set out goals for ourselves, as follows: The purpose of the course is to increase confidence in and enjoyment of the subject. The entire traditional curriculum would pass into the students' heads with minimum recourse to teacher. Students would rely on themselves, their classmates, and their texts. Remember, "Ask three before you ask me!" Periodic tests would be designed to increase confidence, not the opposite. Class time would be entirely reserved for enriching math stuff, over and above, but supportive of, regular curricular requirements.

To do an honest job with the formal curriculum, I needed a good text. It had to be readable and understandable by the kids, be free of abstract formalisms, and have a good index. It had to have a progression of lessons and exercises that were highly regular and thus assignable well in advance, allowing different kids to progress at