

The Teacher

GRETCHEN SCHWARZ

Doing Our Homework

In the midst of continuing school reform turmoil, one theme keeps reappearing: teachers need more control of their professional lives. Mounting concern with this topic can be seen in publications like the September 1986 issue of *Educational Leadership*. Polls also show that many dedicated, bright people are leaving education because they feel powerless. In my own district, a recent survey revealed that one of the top four responses to the question of improving employee effectiveness was "treat employees as professionals, increase trust level."

The teachers who will implement reforms are the ones who have helped in the planning, who have taken responsibility for reforms and demonstrated their commitment. Both for the good of students, then, as well as for the good of the profession, teachers need more clout. However, if we are to succeed in gaining a stronger voice in the decision-making process, we must be prepared. We must be able to relate our expertise to the national, state, and local issues that affect us. We must also become more persuasive. We must, in short, do our homework.

We often hear colleges of education criticized for being too theoretical, not pragmatic enough. In fact, the opposite may be true. Schools of education, along with state legislatures and myriad consultants, barrage us with very specific guidelines and methods.

There are workshops on computer graphics and inservice sessions on making better bulletin boards. What we still need to recover, or discover, is the broader theory, the historical perspective, the world views that inform our particular methodologies and policy decisions.

For example, if an English department wants an additional prep period for all English teachers so they can do a better job of teaching writing, the teachers had better be well informed about composition theory. And to be well informed about composition today requires knowledge of rhetoric, linguistics, psychology, and several other fields. Research in these fields reveals the importance of the writing process and teacher conferencing—all of which demand more teacher time. Knowledge of theory offers teachers solid arguments for their requests. All of us, therefore, need a strong and up-to-date liberal arts education.

More and more voices are urging educators to do their homework, to explore what is going on, not only in their own special fields and in local districts, but also in the larger world of ideas. Both the last Carnegie and the Holmes Reports have emphasized the need for a strong undergraduate liberal arts education. In *The Paideia Proposal*, Mortimer Adler further supports graduate interdisciplinary education to renew teachers' intellectual energies. Adler observes, "We need spe-

cialists for our economic prosperity ... for continued progress in all the arts and sciences. . . . But for the sake of our cultural traditions, our democratic institutions, and our individual well-being, our specialists must also be generalists; that is, generally educated human beings" (p. 72).

As Adler argues, excellent educators are themselves lifelong learners. Lifelong learners are also the most convincing spokespersons for their own ideas. Only broad knowledge and well-thought-out arguments will enable us to act on our own behalf, for our own students, so that we are not left merely to react to orders from "above."

To obtain this knowledge isn't going to be easy; we are already overworked and underpaid. It's hard enough to find time for the daily newspaper. Nevertheless, if education is to have a future as a profession, I believe that somehow teachers must themselves pursue powerful, general continuing education. □

Reference

Adler, Mortimer. *The Paideia Proposal*. New York: Macmillan Publishing Co., 1982.

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Trends

Mathematics

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Don't Be Manipulated by Manipulatives

One of the buzz words in mathematics education this year is "manipulatives." Manipulatives are objects or devices used to show students the connection of mathematics to the real world.

The use of manipulatives is based on considerable evidence that abstract ideas are understood and remembered better and transferred more easily to

new situations if they are derived from the learner's reality. Consequently, students who derive mathematics from the real world will be able to apply the concepts to real problems more naturally and intelligently.

Although I strongly support their use, I have serious reservations about many of the things that happen in the name of using manipulatives. Mathematics teachers using these devices

should consider the following points in order to avoid being manipulated by manipulatives.

First, purchase manipulatives because you *want* to use them, not because they're a new fad. Buying manipulatives and then stashing them in a closet wastes storage space and money. By the same token, don't obtain manipulatives and assume you know how to use them. Inservice

courses and professional meetings can help, but for effective daily use of manipulatives, the best resources are textbooks and teachers' guides—if they explicitly tell and show how to use the manipulatives.

Second, mathematics manipulatives need not be expensive. One of the most effective and inexpensive base 10 counting devices I've used is a bunch of ice cream sticks and assorted rubber bands. Have students count out 10 sticks and bunch them in groups with a small rubber band. When enough bunches are made, they can bunch 10 groups of 10 with a big rubber band. Other free or inexpensive manipulatives include plastic or cardboard number strips (1 unit to 10 units long), macaroni, play money, empty grocery store containers, and fingers.

Third, students should not be limited to just one manipulative—no matter how good it is. Some manufacturers claim their materials can be used to teach absolutely everything from how to count to differential calculus. Whether or not this is true, students should not be led to believe that mathematics depends upon ice cream sticks, or fingers, or any other single device. A mathematical concept is best developed by being encountered in varied contexts. However, the total number of manipulative devices around the classroom should be limited so that they can be kept organized for easy access.

Fourth, every student or small group of students should have direct access to the manipulatives while a new concept is being developed. Being able to maneuver the devices themselves gives students a sense of control over the problem-solving activity. Demonstrations by the teacher and exercises in which students "follow along" with an already derived algorithm are not effective methods. In response to demands from various adoption groups, some publishers have recently added a page or two of manipulative work after the algorithm (or procedure) has already been explained to pupils. Such work is a hypocritical waste of time.

Perhaps the most important thing to remember about manipulatives is to

stop using them when they have done their job and before they interfere with further progress. Most children will naturally stop using such materials at about the right time if an adult doesn't force them to go on; but if students do continue to use such materials too long, the teacher should discourage such activity.

The power of mathematics is in its abstractness. The fact that the same concept applies to many different situations is what makes mathematics useful. If we needed different number systems with different rules to count and do arithmetic problems for each different physical referent, mathematics would be of little use. The potency of mathematics comes from knowing, for example, that if $3 + 4 = 7$, then this is true for people, dogs, apples, and dollars.

Some teachers who become enamored of manipulatives develop the strange notion that nothing should

happen without them. The purpose of manipulatives is to help students understand and remember, after which time students should become efficient at carrying out the abstract manipulations, and recognizing the applicability to every corresponding physical situation. Students who come to depend on manipulatives will not grasp the very essence of mathematics, which is the use of abstract thinking to draw conclusions about concrete things.

Fanatics are those who, having lost sight of their goals, redouble their efforts. Let us be careful not to become fanatics in the use of manipulatives. Manipulatives are helpful when used properly, but quite damaging when misused. □

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