From the Editor

In Praise of Technology Education Content and Method

It is gratifying to be a part of a field that has more relevant and exemplary *content* and *method* than perhaps any other subject area in our schools. This secret has been remarkably well-kept from the public, and to some extent, other educators as well. The problem is, not even those of us in the field have come to accept how important our content has become or how well suited our methods of instruction are to educational institutions in the midst of reform.

Consider first the *content* of technology education. We teach about technology, as we always have. But now, it seems all school subjects are also teaching about technology. Science is the most visible in this respect, but mathematics, language arts, and social studies have taken up the task as well. While the science education community is currently wrestling with how best to teach the relationships between technology and science (see, for example, National Research Council, 1992), progressive science teachers are "just doing it." Toshiba thinks enough of the science/technology connection to have provided $1 million for the new "NSTA/Exploravision" contest. Though promoted last year only to science teachers/students, it is unquestionably a technology contest, and every technology teacher reading this should contact the National Science Teacher's Association to get on the mailing list for next year's contest guidelines. Bob Daiber has shown our profession that we *can* compete successfully in this regard, having had two of his students finish first and second the last two years in the NSTA/Duracell Contest. And, as if $1 million weren't enough for this sort of thing, Nynex and Sprint are also looking to sponsor similar contests. Whatever the new "science standards" currently being developed end up looking like, you can be sure they will address the role of technology in the science curriculum. The math standards have already done so (National Council of Teachers of Mathematics, 1989).

But science teachers teaching about technology is not all that new. Many progressive science teachers have long incorporated the content of technology in their courses. Science Fairs have served as showcases for this phenomenon and the Science-Technology-Society movement has been pushing the idea for more than two decades.

More surprising is *Technology: Inquiry and Investigation* (Doyle, 1992) a beautiful little text that does a nice job of presenting the technological world to the middle school student. When I first saw this glitzy, four-color publication, I thought one of our publishers had released a new gem. Its title led me to believe it was developed for the middle school course "Inventions and Innovations" being taught here in Virginia and elsewhere under similar names. But that is not the case; it is a *language arts* text. Apparently, at least one publisher has discovered what we have known for a century – technology is inherently interesting to many people, and thus it makes sense to use its subject matter as a *medium* to teach other content. This is a theory we have toyed with throughout this century, but never bothered to test empirically. Our literature and research is painfully vacuous in this regard. Nevertheless, other disciplines are playing out that scenario. Incidentally, this language arts text provides a definition of technology that recognizes our content organizers: "Practical or scientific knowledge used to create, build, or move things, to generate energy, or to communicate."

I confess I am not well acquainted with current social studies texts, but I would be willing to wager that they too focus increasingly on technology. After all, the relationship between technology and culture led the Smithsonian Institution to rename what used to be "The National Museum of History and Technology" to "The National Museum of American History." Not surprisingly, its exhibits continue to show a decided emphasis on technology.

The relevance of our content is complemented by our *method*. As educational policy makers struggle to revitalize our schools, they would be well advised to look closely at the methods routinely employed by technology education. Here is where we have always sold ourselves short, for the methods we use are optimally suited to the learning theories currently influencing educational reform. This is particularly true as we increasingly adopt a "technological problem-solving" method in our field.

Proponents of constructivism seek a learning environment in which students can actively build their understanding of the world. I can think of none better than a good technology education laboratory. Not the new, no-think modular variety, but the more traditional general laboratory that facilitates hands-on technological problem-solving. Educational policy makers believe they are standing the world on its ear with "outcomes based education," yet we've always built our curriculum with outcomes in mind. New approaches to the teaching/learning process have led to a frantic search for "alternative assessment strategies." On this behalf, "portfolios" are being touted as a new means of assessment, yet we've required this sort of documentation in our courses for a century.

"Hands-on" activities that address "real word problems" are all the rage, particularly in science and mathematics. We literally wrote the book on this

one. We employ hands-on problem-solving activities for roughly three-quarters of the instructional time in our courses. Moreover, we typically manage a wide range of different hands-on problem-solving activities concurrently in our labs. I do not think we have come to realize how adept and unique we are in this regard. "Hands-on" activity for a science teacher, for example, generally means all students doing the same thing at the same time to observe the same scientific theory or principle. This is analogous to the "Russian System" which we embraced in the late 19th century and have long since abandoned. Can we picture a mathematics teacher challenging some students to solve real-world problems with algebra while some do so with geometry, others with trigonometry and so forth? It just doesn't happen.

Interdisciplinary instruction, the underlying premise of the middle school movement, presents another opportunity for technology education content and method. I can think of no better place in the schools to demonstrate the relationships among technology, science, mathematics, language arts, and social studies than in a good technology education facility using problem-solving activities. This approach is beginning to occur in some of the most progressive middle schools.

There is a growing number of technology education programs that are embracing "technological problem solving" as a means of engaging students in the study of technology. Admittedly, there are others that have not yet made the transition. But those that have are setting an example for all of education. It is downright gratifying, even if it *is* a well-kept secret.

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References

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