

Computer Center

Computers in Education at NABT Meetings

Theodore J. Crovello
Department Editor

As far as Computers In Biological Education (CIBE) is concerned, the difference between the 1981 and 1982 NABT meetings was like night and day, and the 1983 convention in Philadelphia should be even more exciting. In 1981 only one major lecture concerned computers and there were no workshops or exhibitors on CIBE. The 1982 meeting in Detroit saw ten CIBE workshops, many CIBE reports, and exhibitors offering hardware or software. More important, NABT attendees showed an insatiable desire for information about CIBE. Let me highlight some of the events and impressions that struck me during the 1982 meeting. Space does not permit me to discuss them all.

Bioeducators are using computers to do what would otherwise be difficult to do. Often computers can be integrated into the established pedagogy as opposed to requiring a total revision. For example, Gerald Summers and Wemara Lichty discussed TESTOR, a program developed under a CAUSE grant to help evaluate mastery learning strategies on aspects of a laboratory session. The computer generates tests in the lab, a different one for each student. The test is them completed by the student, scored, and returned to the student. An important result is that the student knows what aspects of the laboratory he missed while still in the laboratory.

Theodore J. Crovello is Professor and Chairman of the **Biology Department at The University of Notre Dame, Notre Dame, Indiana 46556.** After graduating from the State University College of Forestry at Syracuse, New York, he received his Ph.D. in Botany at The University of California, Berkeley. Dr. Crovello has long-term interests in the way plants satisfy people's physical and non-physical needs, in the geography of plants, and in the use of computers in biology.

For use in The Computer Center, Ted welcomes suggestions on what subjects should and should not be treated, summaries of educational computing centers, innovative uses of computers, and information about relevant books and events.

Discussions with many attendees revealed that as a group, bioeducators vary greatly in computer literacy. Some clearly see the potential and limitations of what computers can do in education, while others under- or overestimate their capabilities. As professionals we will learn more about educomputing and thus be able to evaluate specific uses more correctly. A frequently asked question at Detroit was what I thought of a particular microcomputer configuration (e.g., the Apple II or III, or the TRS 80 III or Color Computer). My reply had to be that if I or anyone gives you a quick, strong endorsement of a particular piece of hardware, it would be meaningless because I do not know the specifics of your courses or department. And beware: it can

be very costly and painful to choose a microcomputer based only on its hardware. Consider all three components of computer systems simultaneously: hardware, software, and people. The worst situation is when a chairman appears one day with a microcomputer and says here it is, use it! Similarly, many administrators are just realizing the folly of their unilateral decision to buy one or ten microcomputers of Brand X only to find that their educators are educomputing-illiterate (even if somewhat generally computer-literate), *and* that no good educational software exists yet for the model chosen. Microcomputers are not created equal, nor can all perform equally well in your particular educational setting!

Computers were evident among formal exhibitors, including Carolina Biological Supply, Connecticut Valley Biological Supply, Fisher Scientific, Monroe, and Nova Scientific. Some (e.g., Carolina Biological) serve the useful function of conveniently offering CIBE programs developed by groups like CONDUIT. Others were offering their own programs or combinations of programs and computers. By far the most exciting example of the latter was the exhibit by Monroe. Monroe has an agreement with Classroom Consortia Media (Phone 1-800-522-2210) to produce quality courseware for use on the Monroe EC8800 microcomputer. They chose the NABT

Detroit meeting for the first public introduction of their programs which included Photosynthesis, Plant Growth, and the Leaf. For many attendees, the programs provided a glimpse of the enhanced graphic capabilities of the most recent computers. This indicates another dilemma that many educators will soon have to face: for the same total price, do you purchase ten units of a microcomputer with graphics that have been acceptable, or purchase fewer units of a microcomputer with enhanced graphics and storage capabilities like the Monroe EC8800? I was told that the Classroom Consortia Media programs will only be available for the Monroe machine. So will you recommend that your department's next purchase be the more powerful machines? Do you really need them? How will you decide? Be your own consultant and plan *now* to make the best decisions in the *years* to come!

The 1982 meeting also marked the first time that CIBE workshops were offered. In addition to five one-hour sessions, David Firmage offered a two-hour workshop on ecological simulation in ecology. Separate three-hour workshops were presented by myself (CIBE overview and evaluation), John Jungck ("appropriate" uses of CIBE), Frank Price (modelling evolution), and Jim Spain (simulation with microcomputers). Despite unexpected logistic problems, all workshops were packed and seemed successful. All participants and NABT owe special thanks to Carl Bajema for orchestrating the workshop series.

The microcomputer workshop leaders led a panel discussion on the state and status of CIBE (CIBE definitely has high status today but that's not a valid reason to consider using computers). Drawing on his experience with teachers, John Jungck said they often wanted only drill and practice-type programs. This might occur because either

they saw only low-level cognitive material as not threatening, or because many educators still are not certain just how computers can be used in education. All present agreed that computers can change how we teach. But this requires an essential preliminary step: review of how we are teaching *now*! Many may not have performed such an analysis for years, and may even have forgotten how.

During the discussion, Jane Heinze of Cornell University reminded us of the importance of the *affective* domain, of teachers as well as students. Many science teachers enter today's classroom somewhat afraid of computers or at least with little idea of how they can enhance their educational goals. But students enter the same classroom excited about computers, with considerable experience, see how they can be used, and wonder why they are not being used that way. Teachers are quickly catching up with the students in computer literacy. As this happens, the resonance between us, our students, and computers can only increase, followed by increased educational effectiveness.

All present at the discussion agreed that long-term, real support from administrators is essential, both within a department and higher. It is not enough simply to provide one or more computers to a teacher. It is equally important for administrators to support educomputing in their public statements and to budget for necessary additional resources (software, disks, space renovation, etc.). Perhaps most important, they must provide incentives for faculty who are professionally motivated to use computers to enhance their students' learning.

Bioeducators see two useful types of programs; short, no-frills programs written by individual educators or students (e.g., bare-bones calculation of Hardy-Weinberg probabilities); and in-

volved, user-helpful, multifaceted programs usually made available from organizations. Both have value in bioeducation. Their complementary use can combine the benefits of students doing their own programming with those of products developed by organizations having well-established electronic publishing divisions.

A paradox also emerged from Detroit. NABT meeting attendees picked up almost 1,000 copies of my two-page questionnaire about *ABT's* Computer Center Department, and also a detailed registration form that could be used to evaluate programs. I expected perhaps, 50, 100, or even more completed questionnaires to be returned. Instead I still have received only 10! If there is so much CIBE activity out there, why are we not hearing from more of you? Tell us what you want to see in The Computer Center and how you will help *ABT* members stay abreast of developments, articles, products, etc. in computers and education. I cannot reply to all of you personally. But be assured that your suggestions and offers to help will be given serious consideration.

So the 1982 Detroit meeting revealed great interest in CIBE, and it will intensify as more of us increase not only our general computer literacy but also our *educomputer literacy*, i.e., the ability to know when and how to use computers effectively in education.

Looking toward the October 1983 NABT meeting in Philadelphia there will be even more educomputing activities. Ric Garcia and I will present an all-day workshop on the field trip day. It will include hands-on evaluation of many biology programs, review of basic educomputing concepts, and a summary of just where educomputing is and soon will be. Enrollment will be limited, so contact NABT headquarters as soon as possible. On Friday and Saturday Jane Abbott has chosen several

workshops on various aspects of computing to be presented by NABT members. Bob Stamper from Cheltenham High School has assumed the large task of organizing a poster display area of computer projects and a "swap-shop" for (noncopyright!) computer pro-

grams may be available. Finally, a symposium on computers in bioeducation will be held Sunday morning. Topics include a report on activities of the BSCS in computing (J. Ellis); use of computer-based tests (M. Collins); CAI tutorials (R. Garcia); an update on educational

psychology research in educomputing (S. Alessi); concept mapping and computers (J. Heinze, T. Crovello); and the evolution and evaluation of courseware in bioeducation (T. Crovello).

Plan to participate in educomputing at NABT 1983!

See You In Philadelphia!

The Convention Committee has planned an exciting program in an exciting city.

Stop by the Exhibit Area and see an outstanding display of the latest products in biology teaching.

Plan to take a field trip and to participate in one of the many exciting workshop learning experiences being prepared for you.

Drop in to the NABT Booth to meet our staff and officers.

We'll be looking for you!

