7. Direct data acquisition and analysis.

Few modern instruments are designed for manual operation and visual data acquisition. Many run on a continuous basis with data being printed out and/or stored in a computer, often dedicated to the specific instrument. This approach increases efficiency and minimizes human errors in data acquisition. Older instrumentation can often be updated by interfacing it with microcomputers. Once the data has been digitized, it may be processed by the computer in a wide variety of ways. These procedures include weighted averages, analysis of variance, sub-sampling, sorting and printing out in various forms. Clearly, there are good reasons for introducing students to these modern research techniques. Has anyone actually been able to employ them in undergraduate laboratories? If so, what instrumentation has been interfaced with the computer? In which laboratory courses have these methods been introduced? What kind of interfacing equipment is used? What kind of data output has been obtained?

Conclusion

There is clearly a wide variety of applications of computers for instruction in any university science department. Life sciences departments have an especially broad range of applications because of the modern emphasis on quantitative techniques for analysis and synthesis of biological concepts.

Microcomputers provide an attractive solution to these computer needs. They have a memory size which is adequate for almost all biological applications. Many microcomputers have high resolution graphics capable of graphing data and drawing figures. They are easy for both students and faculty to program. And most importantly, they may be easily moved into laboratories and lecture rooms to provide "on the spot" instruction that is hard to achieve with any other kind of computer.

The potential clearly exists for a wide range of applications. The question is "to what extent is this potential being realized in practice?" We would like to share your experiences on these and other applications with our readers. Please sit down now and write me a short description of your successes (and failures) on the application of computers to biological education. We need your feedback to determine future directions on the applications of computers in biological education.

Book Reviews

Emmett L. Wright
Department Editor

Emmett Wright is NABT's book review editor. Dr. Wright is Associate Professor of Science Education, and Director of the Science Teaching Center, at the University of Maryland. He also holds a joint appointment at the University's College of Agriculture in Environmental Science.

Readers interested in becoming book reviewers should contact Dr. Wright directly. Inquiries on this feature should be directed to him at:

Science Teaching Center
University of Maryland
College Park, MD 20742

POPULATION GROWTH, CHANGE, AND IMPACT
by Eve and Albert Stwertka, 1981. Franklin Watts (930 Fifth Avenue, New York 10019). 97 p. No price given. Hardback.

This interesting and easy-to-read book is recommended for all teenagers as an introduction to the concept of population growth and the impact it has and will have on their lives and future generations. Although brief, the book is informative and thought-provoking and, for the most part, treats the controversial topics associated with population growth in an impartial manner.

The book, organized into seven chapters, contains a sorely inadequate further reading list. The first chapter explains why the population in the United States is increasing despite a decline in the birth rate and defines demography and also identifies problems associated with increased populations. The second defines census and provides a brief history of the U.S. census. It describes how the census is conducted and explains its importance, accuracy, and uses.

Dwindling world resources are the subject of the third chapter. Selected paradoxes associated with populations, i.e., people living at a high standard generally limiting fertility in order to maintain that standard, and small populations using a disproportionate share of the world's resources, are discussed in the fourth chapter. The next two chapters cover factors which increase or curb fertility and right to live. A very important point is made that is not often considered by teenagers in the United States; i.e., the right to live cannot be taken for granted, because it is subject to the needs of fellow humans, natural laws of resources, and the will of powerful majorities.

The final, shortest, and best chapter in the book causes the reader to contemplate the future. It states that medical technology has given the power to lower the birth rate and reminds us that what we do with it remains to be seen. It points out that the end will necessarily be misery if the world population remains unchecked.

Thomas P. Evans
Oregon State University
Corvallis, OR

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