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letters

My last point concerns job ads and is as much directed to PHYSICS TODAY as it is to its advertisers. Many of the job ads that appeared this past year were poorly planned, so that it was necessary to read the whole thing before you found what position was open or what specialization was being sought. There were even a couple that did not give all the important information. To make an ad effective, it should have the position, the specialization and the institution in bold-face type at the top, with the details left for last and only for those who are still interested. Could not PHYSICS TODAY make it a policy that classified ads be presented in some reasonable manner?

CHARLES HELLABY
Queen's University

8/85

Kingston, Ontario, Canada

AIP ADVERTISING DIVISION REPLIES: It's difficult to legislate style in advertisements, but Charles Hellaby certainly raises a legitimate point. In future promotional pieces, we will suggest that prospective advertisers highlight the position, specialization and institution at the top of the advertisement.

EDWARD P. GRELEY

8/85

Manager

Computer simulations

In a recent letter (May, page 9), L. Kowalski writes about computer simulations and recommends them to science teachers. As he indicated, I have a long-term interest¹ in this area, so I support their use in learning physics. However, a balanced view should present not only the advantages of using simulations in teaching physics students, but also the possible pitfalls. Only at the beginning and end of his letter does Kowalski discuss the pedagogical situation; much of his letter is concerned with the "nature" of simulations.

My experience over a 25-year period with simulations suggests that they can be valuable, but also that they can be a disaster in some learning situations. There is nothing magical about the computer or any other learning device; the quality of the learning material, regardless of the medium used, is the dominant factor.

Rather than attempt a full discussion, I will make in this letter some statements that I believe to be supportable. My books and papers discuss² some of these:

► Simulations are more effective for learning if they are designed to be used directly by the student, rather than by the instructor.

► Simulations need to have a very

friendly user interface, one that takes into account the student's knowledge, abilities and interests; asking for many numbers, with the student having few clues about what these numbers do, is, for example, an unfortunate beginning.

► We should not confuse simulations with pure games.

► Consideration must be given as to how students learn to use the simulations.

► As far as possible, the initial learning in a simulation should be internal to the program.

► The main pedagogical role of the simulation is to develop student intuition in a certain area through creating "controllable worlds" that allow a wide range of experiences.

► Simulations alone are unlikely to be usable, particularly in large beginning classes.

► Supporting material, either within the program or in the form of associated workbooks, is essential.

► We should not assume that a simulation that is extremely interesting for the professional physicist will also be interesting to students.

► Development of good simulations, in the pedagogical sense, is a time-consuming and expensive activity.

I would be happy to discuss these issues further with others.

References

1. A. Bork, PHYSICS TODAY, September 1981, p. 24; Am. J. Phys. 46, 3 (1978); Computer, October 1979.
2. A. Bork, Am. J. Phys. 38, 5 (1970); A. Bork, S. Franklin, M. Katz, J. McNelly, Science NECC 81, June (1981); A. Bork, Computer Assisted Learning in Physics Education, Pergamon, New York (1980); Personal Computers for Education, Harper and Row, New York (1985).

ALFRED BORK

Educational Technology Center
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6/85

Fair reporting

How proud I am of PHYSICS TODAY for continuing to publish all sides of important issues, such as the articles (June, pages 24, 34) by Gerold Yonas and Wolfgang K. H. Panofsky on the Strategic Defense Initiative—especially today, when there is an almost religious intolerance in much of the academic community and in certain "scientific" journals toward dissenting views and their holders. It cannot be stated too often that democratic societies have long found in political, judicial or other controversies that the best approach to the truth comes through hearing fully all sides of the issues.

JOSEPH J. DEVANEY

7/85

Los Alamos, New Mexico □