

**NAIS** NATIONAL ASSOCIATION OF INDEPENDENT SCHOOLS  
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TWENTY QUESTIONS ABOUT COMPUTERS

In January, 1983, the NAIS Academic Services Committee began to explore the uses of computers in education. We soon realized that simply looking at current practices did not adequately address the broad issues associated with computers and education.

To assist us in examining these issues, we invited Robert B. Davis, associate director of the Computer-Based Educational Laboratory at the University of Illinois, Urbana, and Steve Bergen, codirector of The Teaching Company, in Brookline, Massachusetts, to join us at our April and October meetings, respectively. "Twenty Questions" emerged from these meetings. Originally drafted by committee member Priscilla Vail, the questions are not offered as a definitive list but as tools for schools, teachers, and students in the evaluation of computer use.

These questions, together with several articles on computers, will appear in the May, 1984, issue of the NAIS quarterly magazine, Independent School.

12/17/05 To Steve Bergen

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**Patrick F. Bassett" President, National Association of Independent Schools**

TWENTY QUESTIONS ABOUT COMPUTERSSocial/solitary aspects

1. Do the uses of computers in the school foster cooperative ventures? Solitary work? Both? Is the school pleased with the proportion? What are the relative merits of having students send sparks back and forth between minds and having them engage in solitary investigation at a terminal?

2. Some students need to learn and practice social skills as much as or more than academic ones. How often is the computer a hiding place for these students, and what effect does solitary work at a terminal have on a child who needs to socialize? Is the computer any more of a hiding place than a book or a chessboard? Might the computer offer the solitary or shy child a way to gain recognition and make friends? Should social considerations enter into deciding where to locate terminals in the school?

3. Some computer materials are described as "teacher-dependant," others as "teacher-proof," the one implying nurture, the other distance. How does the school, through its educational program, create the best combination of dependence, independence, and interaction? How might the computer support or inhibit that effort?

4. A twelve-year-old boy facing minor surgery who was afraid he might not survive went to his terminal and typed his fears into it. It was easier for him to confide in a machine than in a human being. Adults, too, sometimes find it easier to talk to a machine than to another person. How can schools encourage the use of machinery as a tool and as a repository for thought while emphasizing the power of human exchange in accepting and resolving ambiguity?

Developmental considerations

5. Many teachers and experts in the field of child development feel that young children need tangible, concrete experiences to develop concepts. Young children are, and need to be, physically active. The computer, by its very nature, restricts physical activity to hand-eye coordination. Taking mathematics as an example, do computer programs based on pictures hinder or help conceptual understanding? A child may memorize number facts but not comprehend what they represent. Ability to spout those facts may actually conceal underlying confusion. How can the computer programs and languages teach concepts as well as computation?

6. We see pressure on students to acquire "computer literacy," which requires standardized, artificial-seeming phraseology. At the same time, we see equally powerful pressure on them to gain "literary literacy" by improving their reading comprehension and writing skills, expanding their vocabularies, enriching their use and understanding of language and its nuances, and developing subtlety, originality, and freshness of expression. Are these forms of literary opposites, or do they stimulate each other? How can we achieve both?

7. Intellectually alert students like to wrestle with open-ended questions. Do enough computer programs legitimately stimulate and satisfy this appetite? Or does the dazzling range of subroutines the computer can handle mask routine with seeming novelty? Is this something to worry about or not?

8. What effect will computers have on learning disabilities? Will the dyslexic, dysgraphic, dyscalculic, or disorganized student be liberated or frustrated by a tool that requires linguistic precision, conceptual and symbolic thinking, accurate memory, and sometimes rapid eye-hand coordination?

9. How will the computer affect the education of gifted and talented students? Will it free them from restrictions imposed on them by time and place, or will it isolate them even more from their peers than they already are? Is the computer, with its capacity for putting people in touch with information from around the world, well matched to the gifted child's ability to make novel connections and patterns? Might the speed with which the computer works and responds reinforce the gifted child's natural impatience with slower human thinkers? How can schools help these children catch the benefits yet avoid the pitfalls?

#### Applications

10. Assuming that the computer serves as a means rather than an end in itself for most students, what skills ought to be taught? Should students learn how to program? How to use programs? Both? Why?

11. How many software programs that supposedly teach thinking are actually drill and practice in disguise? And when students do need drill and practice, is the computer the best instrument? Will the novelty wear off, or is the computer's capacity for instant results and seemingly unlimited patience ideally suited to the learner who needs reinforcement? Can the computer save teachers thousands of hours of routine instruction that could be used more creatively? What supervision is needed to make sure that students are really doing the task, not just pushing the buttons?

12. What effect will word processing have on the quality of student writing? At what age can a child learn to use a computer for word processing in a reasonable amount of time? At what age are editing and rewriting appropriate, and at what age counterproductive? Are programs that correct spelling and grammar electronic "trotts," or do they free the mind to concentrate on ideas, not mechanics?

13. How can schools use the computer to bring the arts and sciences closer together? Conversely, what types of computer use enlarge the gap between them?

14. Are creativity and computer use mutually exclusive? The computer can relieve the creator of ideas of much drudgery and provide opportunities for invention through electronics. When teachers are intimidated or reluctant to use the computer, they have difficulty seeing its potential for developing higher-level thinking skills. How best to reduce this intimidation?

### Institutional considerations

15. What considerations influence purchasing decisions? One school of thought advocates buying many inexpensive machines and lending them to students for use at home. Another prefers fewer, more expensive machines kept at school. Whereas microcomputers are isolated stations of electronic wizardry, computer terminals connected to a central processing unit provide communication within, and in some cases beyond, the school. How much is the school willing to invest in products that change so rapidly? How willing is the school to accept guaranteed obsolescence for the sake of a head start?

16. How should curriculum planners and teachers evaluate the avalanche of new software aimed at all ages and levels? While some programs are of high quality, many are not educationally sound. Giving a child a poorly designed program is at best a waste of time, at worst confusing or harmful. Should classroom teachers be responsible for evaluating the language arts, mathematics, social studies, and other programs for their grade level? Where will they find the time? How does one evaluate programs that are heavily protected--products that, once taken out of their wrappers, may not be returned? Will many schools add a computer coordinator to the staff? Might neighboring schools band together to pool their supply of information, and perhaps even their supply of programs?

17. What goes out of the curriculum when the computer comes in? Is the school satisfied with the trade-offs? School A gives computer class half the time once used for science. School B allows students to use the computer instead of going to study hall. School C allows students to choose computer, art, or music as an elective, when the choice used to be just art or music. How do we choose?

### Larger philosophic issues

18. Before long, it will be possible, through the computer, for individuals to have access to the entire world of stored information. What should schools be doing to help students make intelligent, creative use of such massive amounts of information? What kind of intellectual training do scholars at all levels need in order to feel empowered rather than engulfed?

19. The history of education is filled with episodes of bandwagons and promises of panaceas. What can schools learn from the past to help keep computer use in proportion now? Are computers tools of the adult world but an educational fad, or are they electronic wings? How should we evaluate their power and their effect?

20. We ask these questions at a time when we are being deluged with reports of educational mediocrity and urged to revive academic excellence. Might the push for quality, accompanied by a push for quantity, foster a climate of going for the sure thing instead of taking a risk? Do we run the danger that computers will be overvalued for rewarding predictability and thereby stultify originality? Might technology heighten the impulse to unethical access to private information and confer status on illegal behavior? Are these genuine perils or fantasies? How do we decide? What do we do?