Letters

Programmed Instruction

In his proper concern ("What are professors for?", 18 June, p. 1545) with aspects of education that only a meeting of minds between student and teacher can provide (guidance, motivation, sense of values), Abelson mentions programmed instruction, probably unintentionally, in a way that makes it appear as one of the *causes* or *symptoms* of depersonalization of education. It may be that it is one of the *remedies*, if used in its place. The most precious part of education is the nurture of the spirit; we need good teachers to convey the pleasures of learning and of continuing to learn, the joy of discovery, the satisfaction of duty well done. But good teachers are few; one important virtue of programmed instruction for higher education is that it helps conserve one of our valuable and limited resources, the time of competent teachers.

Programmed instruction does not replace a good teacher; it amplifies his teaching powers, making him more effective and more efficient, enabling him to teach more people more things with no more effort and with better quality control. It makes it easier for the student to learn "facts"; by teaching recognition of recurrent patterns, it may also help him develop his faculty of abstract reasoning. Programming no more replaces teachers than the printing press replaced storytellers 500 years ago; printing a story or programming a course merely helps to spread existing values. Young people of all ages need both *education* and *instruction*, knowledge of the world around them and the ability to judge it and change it where it needs to be changed. A pupil is both a vessel to be filled and a candle to be lit; he is a lamp. Knowledge of facts is oil for the lamp, and programmed instruction is a good way to provide it without effort. This makes it ready to receive the light from the teacher and spread it.

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. . . At the start of his editorial Abelson says, "Large classes and the use of television films and programmed instruction have tended to make teaching impersonal and mechanical," and at the end, "Television and programmed instruction are here to stay"—announcements which will be read with some surprise on many campuses. In their context, the statements make these media and techniques sound like lowly vegetables indeed in the flowery groves of academe. I would argue that it is not these technological developments which help make teaching impersonal and mechanical but rather the failure of many teachers to seek ways of making creative and rewarding use of them. Do poor textbooks tend to make teaching impersonal and mechanical? Do lectures based on yellowing and crumbling notes tend to make teaching impersonal and mechanical? Do graduate assistants teaching basic courses while pursuing their own studies tend to do so? Of course they do. And they also tend to make large numbers of potentially first-rate students discontented and often even rather contemptuous of the professed aims of higher education.

Advances in educational technology will scarcely replace the good teacher, but they will be no better than the use he makes of them. Properly prepared and used, programmed instruction material can provide that teacher with the kind of classes he has always claimed he wanted—classes composed of students who have absorbed the necessary information about the subject matter to enable him to make his own unique pedagogical contribution. In most cases, there is no reason why a good program cannot be written to offer the student a stimulating learning experience that will motivate him to look further into the subject. A good program, after all, is the result of a close collaboration between author (it is to be hoped, an excellent teacher) and many students, each learning from the other as the material is tested and revised until it meets its objectives. Good programs do, in fact, exist, and use of them has indicated that students have enjoyed them and learned from them, sometimes even when these materials were not very wisely used. A film, a book, or a program which impresses its audience as being the product of a teacher who is interested in his subject and, most important, who cares that his students learn, certainly offers more to the cause of good education than does the academic time-server or professor who sees his students as simply so many hurdles to be leaped on the way to the laboratories or the stacks.

If, as Abelson says (and I hope he is right), television and programmed instruction are here to stay, one might infer that they are providing some benefits to education. The responsible commercial producers of films, TV, programmed instruction, and textbooks are deeply involved in the cause of better education at every level. What is needed from others who are similarly concerned are suggestions, comments, and criticisms directed toward improving these instruments of instruction and the uses to be made of them.

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Political Principles and NIH

I too have been awaiting comments on the Wooldridge Report, as has Arthur Gellhorn (2 July, p. 6). Gellhorn's comments are interesting and may appear biased in favor of NIH's intramural program because of omission of an American political principle. No one who has had contact with the intramural scientists of NIH will deny their competence and contributions or their continuing valuable relations with the rest of the scientific community. I have personally received needed assistance from my friends in government service, and I hope I shall continue to do so.

Two philosophical considerations inevitably color attitudes toward the intramural programs. The first, and weaker, is the unspoken feeling that government service tends to prostitute, to weaken moral standards. We all recognize that less than devotion to government service may be associated with other loyalties, for instance to pressure groups or political parties. Also, we are aware of the present and potential political usages of science and scientists. The weakness of this consideration is the failure to account for the generally high integrity of scientists.