



The Personal Computer at the Liberal Arts College

by James L. Powell

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The new level of interest in computing at liberal arts colleges enables me to begin with the provocative assertion that: The relatively inexpensive personal computer has changed forever the style of computing in this country and is about to cause a similar change at liberal arts colleges.

Up to now, most colleges have been unable to afford state-of-the-art mainframe computing and have had to make do with smaller machines, perhaps one generation behind those available at large research universities. This contrast between the *college* computing environment and that at the *major research institutions* was recently brought into sharp focus by MIT's Project Athena: MIT conceived the idea, procured some 50 Digital Equipment Corporation VAX minicomputers, and hired an entirely new staff. Clearly, liberal arts colleges do not have such tremendous resources and must find a different path.

Today, that path is available, because for no more than the cost of books over four years or a good stereo system, students at liberal arts colleges can have their own personal microcomputer — one with as much power as provided by mainframe computers a few short years ago. The microcomputer's low cost and great utility make it inevitable that within a few years most students on college campuses will have their own — already many freshmen arrive with theirs in

tow. The point is that colleges can either attempt to control this movement or simply let it happen — and far more educational benefit can be gained by control. How then does a college make this happen?

Several colleges and universities already require or strongly recommend that their students buy the institution-approved personal computer. At Franklin and Marshall a faculty committee has been studying this possibility for most of the past year; it is from their report that I have put together the following remarks. I intend here not to report on the findings of the committee, as Franklin and Marshall is now in implementation phase, but to raise, for other liberal arts institutions, some of the questions, problems, and issues we've encountered in the investigative process. It is hoped that these questions will help other liberal arts institutions plan effectively.

Microcomputers or Terminals?

Clearly, a program of student-owned microcomputers not only adds to student expenses, but can substantially increase a college's already constrained operating budget. Since Franklin and Marshall owns a mainframe computer for a variety of administrative uses, the important and logical first option in considering a microcomputer program was whether or not the additional

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resources could be provided by simply adding more terminals to the present system. Several significant factors were considered:

1. The diversity of software available for the microcomputer far exceeds that available for any mainframe computer. This is a major advantage, yet questions arise about how that software can be made available locally (reports of illegal copying are rampant) to large numbers of students at reasonable prices. More and more institutions and software vendors are addressing this problem through site licensing and volume discount arrangements, but no standard practice yet exists for providing micro software at a reasonable price to colleges where most often tens, hundreds, and even thousands of copies may be needed.

2. Word processing is and will likely remain the principal use of computers on college campuses, especially those emphasizing liberal arts. Many universities and some liberal arts colleges are already close to the saturation point in the mainframe time-sharing mode and have no room for expansion without considerable expenditure of funds. Word processing is not an inherently efficient use of time-shared systems.

3. Convenience, availability, and security. A terminal located in another building or down the hall on another floor obviously is less convenient than a microcomputer in a student's room, especially when the mainframe is "down" and unavailable. But both modes — additional terminals and student-owned microcomputers — raise important space and security considerations.

Designating an "Official" Microcomputer

An institution that wishes to mount a student microcomputer program must deal with the question of whether or not to designate a single "official" college machine. Selecting a single machine has the inestimable pedagogical advantage of allowing faculty to give assignments with the knowledge that every student has convenient access to exactly the same hardware and software. Unless an official machine is designated, students will continue to arrive with a wide variety of computers and expect to use those rather than some machine they either do not own or which is located somewhere else. Obviously, if a wide variety of machines are already represented on campus, manufacturers will show less interest and offer less substantial discounts due to a smaller "market" for their machines. Yet if a single machine is designated, what is the probability that a new machine, with more power and additional features (a great lure for students) will appear on the market

shortly thereafter?

Require or Recommend?

If a single official machine is chosen, requiring would ensure that every student has the same machine, permitting maximum (and equal) educational benefit and reducing the number of college-owned machines provided for students unable to act on the strong recommendation. Software demonstrations could be arranged for students and faculty with assurance that they were pertinent to all. A known quantity of machines would exist on campus, facilitating financial aid planning, and the impact on the college budget could be more readily calculated.

On the other hand, several advantages arise from recommending rather than requiring purchase. The impact on admissions of a required microcomputer program is still uncertain. All liberal arts colleges today are worried about admissions and certainly none would want to do anything to discourage applicants, but some high school students still profess antipathy toward technology in general (and computers specifically) and might be turned away by the requirement that they spend \$1,000 or more on a computer system. This attitude will diminish rapidly, but is still a factor today.

In addition, there is the question of timing and "truth in advertising." For example, Franklin and Marshall has already announced costs for the 1985-86 year. Were the college to raise costs upward to reflect a required computer purchase, what would incoming students think? Merely recommending the computer avoids or at least reduces the seriousness of these issues.

Recommending rather than requiring would also lessen, or at least delay, the economic impact for those students who had already purchased a machine other than the official one. It seems overly harsh to force such students to buy a second machine, yet if they do not, additional machines will have to be made available in locations around the campus. Further, recommending rather than requiring might

better enable the institution to change the "official" machine or even the entire program.

Selecting the Microcomputer

How is the "official" machine to be selected? The variety of available microcomputers makes this a daunting question. Franklin and Marshall identified some 30 different personal computers that might be acceptable and culled the list using the following criteria:

1. List cost of the machine and type of discount available. (The cost per unit of computing power has declined steadily ever since computers were first invented and apparently will go on doing so. A powerful microcomputer can be bought off the shelf for under \$2,000, and some quite adequate machines are even available for under \$1,000. Many manufacturers are quite ready to talk to institutions about volume discounts for their machines.)

2. How approachable is the manufacturer? How interested are they in your institution?

3. What kind of services will they provide or make available?

4. What is their reputation?

5. Will they provide bundled software, or help procure it from third party vendors?

6. Is the machine portable and how valuable is portability? (College students are a peripatetic lot — they hardly ever stay in one place for longer than a few hours, including their dormitory rooms. Portability would seem a natural advantage for personal computers on college campuses, yet it remains to be demonstrated that a portable computer can be made with the same overall quality and screen legibility as some of the larger machines.)

7. What is the quality of screen and keyboard? (The keyboard is particularly important since the machines will be used most heavily for word processing.)

8. What software is available and what kind is likely to be available in the future?

9. How much memory does the machine have, and can it be easily and inexpensively expanded?

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10. Does the machine offer one or two disk drives?

11. What other options are available (color monitor, modem, mouse, etc.)?

Implementing the Program

Once the microcomputer has been selected and the institution has an idea of how many will be purchased, requisite changes and additions to facilities must be considered. Will it be necessary to modify dormitory rooms to provide more or different electrical outlets? Should changes be made in such a way as to allow for eventual networking? Do already crowded student dormitory rooms allow enough physical space for one or two personal microcomputers? How many work and print stations will be necessary, and what modifications will be required in those locations? Also, importantly, what security measures will be needed in dormitories and academic buildings?

Does the college purchase in volume and sell to students, or do students buy directly from the manufacturer? If the college purchases, should the machines be tested before handing them over to students? Is a software package included, and what does it comprise? What peripheral devices?

A particularly vexing question has to do with financial aid. Will it be provided, and if so how? At one extreme, the institution could simply add the cost of the computer to the regular student budget, which, if the self-help and loan components are already fully met, would require an increased grant and in effect mean the institution would *buy* the machine for needy students. This policy also could cause many more students to cross the line into the needy category. At the other extreme, the institution could take the position that no financial aid of any kind will be offered. Perhaps an intermediate position, such as providing needy students with a low or no-interest loan, is preferable. In any case, spread over four years of college the cost of a useful machine may be only a few hundred dollars annually, 3 to 5 percent of the total cost of yearly attendance.

Other Considerations

Many other additional costs to the college will result from a student microcomputer program. Computers either will have to be given or provided at a substantial discount to faculty members expected to use the machines in their courses, and some members of the administrative staff may deserve the same benefit. Purchase of in-

stitutionally owned machines and print stations will be expensive, as will be maintenance for servicing the machines, a major consideration. (Will the institution provide service or "farm it out" to a local dealer?) There also will be additional costs for insurance and security. As the program begins, good knowledgeable communication about the program with current and prospective students will be critical — and an extra expense. There also may be some opportunity costs as a result of providing time for the program in various college activities — Orientation, for example.

Unless computer use is to be restricted to word processing and spreadsheeting, institutional funds will have to be spent for development (or acquisition) of innovative

college-level educational software. Some students will be disgruntled unless they encounter such software early in the freshman year.

If successful, however, a student microcomputer program will have a major effect on the curriculum and the faculty. Faculty must be trained to use the machines in their courses. The introduction of large numbers of microcomputers on campus may also produce a demand for more courses in computer science. The library may be affected, as will courses in writing. (Several interesting new writing packages are becoming available that contain not only text processors, but outlining and "startup" aids.

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spelling checkers, programs for text analysis and feedback, etc., changing fundamentally the way writing is taught on our campuses.)

A number of questions arise under the heading "student life." Will we create a generation of reclusive "hackers," hidden away in dorm rooms, staring for hours on end at a computer screen? Will life in the two-computer dormitory room be different? Will the institution attract new types of students and lose others as a result of a computer requirement or recommendation? Will men and women react differently to the program and to the college? Will already pressured students be under even more strain?

Finally, a class of problems fall under the

general heading "ethics." The microcomputer is wonderfully designed for software copying, whether it is a program owned by a friend, or a paper written by someone else. Plagiarism is also easy on time-shared systems, though mainframe security makes it very difficult to acquire someone else's work without their connivance. Copying whole software programs without the benefit of a site license, however, it is a problem unique to the microcomputer. Some schools believe that these ethical issues are the most serious associated with a student microcomputer program.

All of these are difficult questions to answer, yet critical to our integration of the "computer revolution" throughout liberal education. Steve White of the Sloan Foun-

dation has written that "to be liberally educated is to understand one's culture." Since our culture is, and increasingly will be pervaded by the computer, understanding these machines and their provisions and impact on campus life and education is not only consistent with liberal education, it is necessary.

One way or another, liberal arts colleges are going to have to do more about computing, and it is going to cost money. The question is no longer whether that money should be spent, but only how. I predict that sooner or later the answer will be: "by having students purchase the computer power they need, for themselves." More education will be accomplished by having it come sooner. □