Fat Pencils


This year's editorials all focus on one specific problem—the inability of our educational system to adequately deal with the very rapid Information Age changes that are occurring throughout the world. Previous articles have suggested that our formal schooling system needs increased help from our informal educational system.

This article focuses on the idea of providing students and teachers with a general-purpose set of productivity tools.

Fat Pencils

Before my first day of school, my parents were given a list of school supplies they were to provide for me. One of the items was a "fat" pencil. This type of pencil is much fatter than the pencils that adults use. The lead doesn't break as easily, and it is easier for young children to hold and use.

Of course, a fat pencil will do pretty much the same things as a regular pencil. Also, young children were weaned from fat pencils as soon as their fine muscle control proved adequate.

The fat pencil idea raises some interesting ideas in terms of computer tools for students. Should we provide special hardware and software for young students? How soon should we wean students from the special hardware and software?

These are hard questions, and I am not aware of much research in this area. However, lots of my friends are using the regular computer hardware with their very young children. Children can learn to make use of a computer mouse and keyboard well before they begin kindergarten.

Young children can also learn to make use of a hard drive and a CD-ROM. It is clear that there is a strong trend toward the CD-ROM drive becoming commonplace. (Many of the newer computer games are only available on CD-ROM, although that is not the only reason for the rapid proliferation of CD-ROM drives.)

The remainder of this article focuses on software. There are lots of nice software packages designed for very young children.

However, by and large, the applications software designed for very young children lacks many of the features that they will find useful as they grow older. Some versions of Logo provide exceptions to this rule.

Thus, parents and educators are faced by the problem of when to begin the weaning process and what to wean to.

Generic Productivity Tools for Students

A word processor is an example of a generic productivity tool. It is useful over a wide range of academic disciplines, both in school and outside of school.
A word processor can be contrasted with professional desktop publishing software. While the latter software has many uses, one can think of it as being designed for specialists or professionals.

If you were designing a generic set of software for students and teachers, what would you include? Clearly you would want the usual tools such as word processor, database, spreadsheet, graphics, paint, draw, and telecommunications.

You would want some multimedia and hypermedia tools. This is because you would want students to learn to create nonlinear, multimedia documents.

Next you might think about each specific discipline. Surely you would want a mathematics package and productivity tools aimed towards other specific disciplines. Thus, you would want a music package, an art package, and so on. In each of these areas you would likely distinguish between an introductory or generic tool and a professional tool.

You would also want a set of multimedia reference materials such as an encyclopedia, atlas, common quotations, and so on. Here, we are using a rather broad interpretation of the meaning of "tool" in the computer field. This is consistent with the trend toward building productivity aids into software, such as a including a thesaurus or dictionary in a word processor.

To further extend the example, you might like a basic reference library, perhaps consisting of about 30-40 reference books, in each of the disciplines that are included in the precollege curriculum.

In total, the generic productivity tools described in this section might fill four or five CD-ROMs. Thus, aside from issues of copyright, mass production of millions of copies would cost well under $10 per set.

**Wean Students to a Generic Library**

The productivity tools discussed in the previous section can be thought of as one component of a Generic Library for students and teachers. There are many other possible components. For example, one might consider the possibility of providing students with computer-assisted learning materials that are appropriate to their academic development levels and that cover the entire curriculum. One might think of providing teachers with a wide range of curriculum materials. And, of course, one wants to provide students access to current materials whose contents change on a day-today basis.

I can easily visualize a future in which all students have routine access to a computer with a CD-ROM drive. Moreover, I can easily visualize that the storage density on a CD-ROM will be 10-20 times what it is today. This would allow a huge library to reside on a single disk. Thus, I can easily contemplate the idea that all students could be provided with a generic library of productivity tools. I do not need to stretch my imagination to believe that such a generic library might be updated every year.

It is such a generic library that I would wean students to.

While the generic library of productivity tools that I have described does not yet exist, large parts of it do. An integrated "works" package contains a good start on the needed software. There are a variety of CD-ROM-based libraries of resource materials. Many new computers are now being sold with a combination of an integrated package of software and a collection of such CD-
ROMs. If I were a parent of young children currently in school, I would wean my children to such resources.