Teacher Productivity Tools


Sometimes when I sit down to write an editorial, the words seem to literally flow off my fingertips. The underlying message is clear and formulating it is easy. An hour at the keyboard, and I am nearly done.

But sometimes that is not the case. Then I start, stop, restart, and so on, over and over again. In such cases I generally try to figure out what is going wrong. Am I suffering from some sort of writer's block, am I suffering from lack of direction, or is there some other major source of difficulty?

Well, right now I am spinning my wheels. I want to write about Teacher Productivity Tools, and I certainly know a lot about this topic. But I have already written and discarded a half dozen first paragraphs. What is my problem?

I think I know the answer. I don't want to offend my readers. I am afraid that the message I want to convey is not a message that teachers want to hear.

The expression "teacher productivity tools" has come to mean software such as computerized gradebooks, test generators, presentation graphics, and other software that is used by teachers as they work at their profession. A word processor is a teacher productivity tool if it is used to write and modify handouts for students, lesson plans, letters to parents, and so on.

All of that is well and good. But why isn't computer assisted instruction a teacher productivity tool? Since one goal of education is to have students learn, it would seem that software that helps students learn more, better, and faster would be considered to be a teacher productivity tool. Or, why isn't hardware and software that eliminates a major piece of the curriculum a teacher productivity tool? The lowly hand held calculator, which can eliminate significant chunks of several years of the current math curriculum, provides a good example.

Now I see the source of my difficulty in attempting to write this editorial! Almost no teacher wants to believe that a significant portion of what he or she does can be done by a computer. Almost no teacher wants to believe that large parts of the current curriculum have become nearly irrelevant because of computers. Thus, I believe, teachers have carefully limited the meaning of teacher productivity tools and have developed a definition that tends to mask the whole issue of increasing teacher productivity.

This can be contrasted with what has occurred in business and industry. For all practical purposes, the computer industry has been driven by the productivity gains accruing to computer users. IBM has yearly sales in excess of $50 billion because over a wide range of job categories, the people who use computers effectively are more productive than those who lack computer access. This has lead to huge changes in business and industry, where productivity gains lead to increased profits, or at least to remaining competitive and staying in business.
Now let me switch gears for a moment. In some of my workshops I make use of a computer attitude scale. The workshop participants are asked to respond on a scale of 1 (strongly agree) to 5 (strongly disagree) to statements that include:

1. Computers can teach better than teachers.
2. Computers can displace teachers.

Invariably the mean response on these two statements is above 4.75, with a huge majority of responses being strongly disagree.

But then the interesting discussion begins. Are there some pieces of the curriculum that computers can teach better than some teachers? Surely the answer is yes, if we are to believe the research on computer-assisted instruction. If so, then computers can displace teachers.

It is not that we now have a computer that can do all that a human teacher can do, and so might replace teachers on a one for one basis. Rather, if suitable computer-assisted instruction facilities are available, the total number of teachers needed might decline.

A similar argument is proposed for computer applications that might lead to dropping substantial chunks from the curriculum. For example, suppose that we agree that one goal of education is that students should learn to perform at the 80% level or above on a computational test covering addition, subtraction, multiplication, and division of multi-digit decimal numbers. Right now we devote huge number of hours of instructional time and student study time to this topic. This would be greatly reduced if we merely gave students hand held calculators and a little instruction in their use.

By now many of my readers will be experiencing a certain level of hostility, discomfort, or desire to enter into the discussion. The careful reader may note that I have not advocated that computers be used to displace teachers. Indeed, I strongly support that we use computers to increase teacher productivity and use this increased productivity to improve the outcomes of our schools. There are many things that humans can do far better than computers, and schools would be much better if the teachers could devote more time to such tasks.

But there are many tax payers, school board members, and legislators who are beginning to understand that computers and other related technology can indeed increase teacher productivity. Many of them would like to translate this increased productivity into decreased costs of schools. For them, this line of reasoning suggests that computers should displace teachers.

Sooner or later teacher will have to face this challenge. It seems to me that it would be better if teachers themselves brought up the issue. Teachers clearly understand that much of what they do cannot be done by computers. They clearly understand that schools would be better if they had more time to do the types of tasks that humans can do and computers cannot. Let’s raise the issue and carry it to the tax payers, school board members, and legislators. An aggressive approach can lead to significant improvements in our school system.

**Retrospective Comment 1/19/05**

Less than a year ago I read one of Peter Drucker's in which he discusses productivity. Peter Drucker is a consultant and writer in business. He published his first book the year after I was born, and he is still making significant contributions to his field. One of his areas of focus has been changes in productivity. For example, at the time of the American Revolutionary War, about 90% of the population were farmers. Now, less than 3% of the population are farmers, and
they produce a large surplus for export. Roughly speaking, the productivity of farmers in the US has gone up by a factor of 50 in the last 230 years.

Drucker estimates that the productivity per worker in the industrial manufacturing sector has also increased by a factor of about 50 over that period of time. He then looks at other sectors, such as education.

Our education system is highly labor intensive. It is somewhat difficult to define what we mean by productivity. Certainly it means much more than the number of "student seat hours" produced per employee. In education, we are looking for high quality results—students getting a modern education that appropriately prepares them for adult citizenship in our society.

Research suggests that reducing class sizes increases student learning. We can certainly quantify what we mean by reducing class sizes—such as a 50% decrease in average class size. But, can we quantify student learning in a comparable manner? What would it mean to make an assertion that students learned twice as much in a given amount of school time? Perhaps we might mean that the learning rate doubles, and all other things such as retention and ability to use one’s learning remain constant. But, suppose that students learn 1.5 times as fast, show 10% gains in both summative evaluation and long-term retention evaluation, and score higher on a test designed to measure interest in and satisfaction with schooling?

You should be able to see that productivity in education is a "bit of a sticky wicket." While I'm at it, let me further complicate the issue. Suppose that we have a curriculum in which students learn the care, maintenance, and driving a horse-drawn wagon. Over a period of years, we gradually improve the curriculum content, instructional process, and assessment. Students perform better on the tests. We do all of this without increasing the budget. Then, we might well say that we have increased productivity. However, suppose during the same period of time gasoline-powered trucks are invented and come into widespread use, greatly decreasing the use of horse-drawn wagons. Now, would we say that we have increased the productivity of our education system, as we continue to produce "product" (graduates of our program of education) who are not qualified to work in the truck-maintenance and driving industry.

Hmmm, you might say to me. You might ask, "Are you suggesting that both our curriculum and our methods of teaching are somewhat in the horse and wagon era, while our world has moved on well beyond that? If you ask this question, then you have gotten my message!

The editorial was published in May 1989, a little more than 15 years ago. The message is still fresh.